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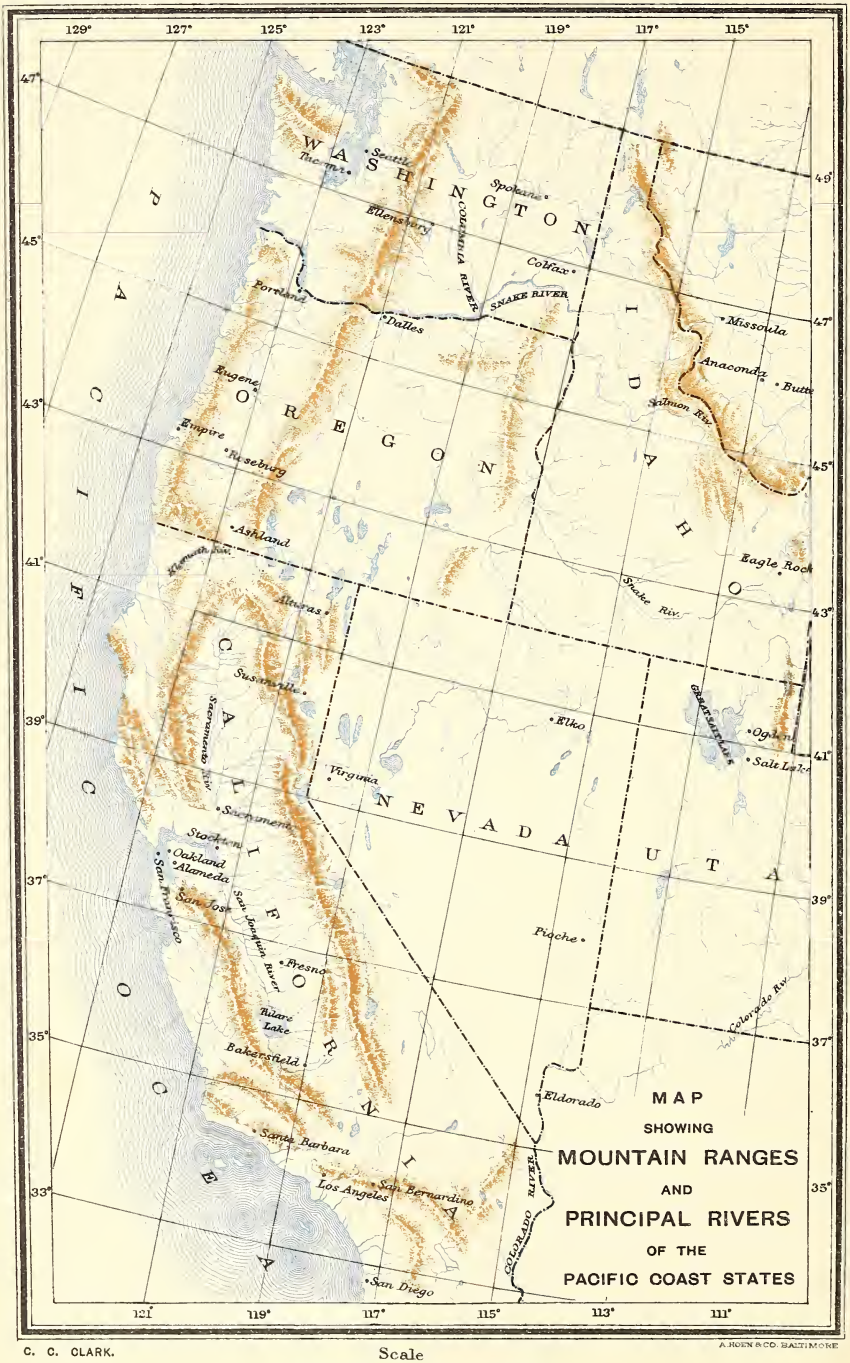

C. C. CLARK.

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MISCELLANEOUS SERIES.—BULLETIN No. 20.

U. S. DEPARTMENT OF AGRICULTURE,

DIVISION OF STATISTICS,

JOHN HYDE, Statistician.

WHEAT GROWING

AND

GENERAL AGRICULTURAL CONDITIONS

IN THE

PACIFIC COAST REGION OF THE UNITED STATES.

BY

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LETTER OF TRANSMITTAL.

U. S. Department of Agriculture,
Office of the Statistician,
Washington, D. C., April 27, 1901.

Sir: I have the honor to transmit herewith a report on Wheat Growing, etc., in the Pacific Coast Region of the United States, prepared, under the general direction of the Statistician, by Mr. Edwin S. Holmes, jr., a special agent of the Division of Statistics, and to recommend the publication of the same as Bulletin No. 20 of this office.

John Hyde,
Statistician.

Hon. James Wilson,
Secretary of Agriculture.

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WHEAT GROWING AND GENERAL AGRICULTURAL CONDITIONS IN THE PACIFIC COAST REGION OF THE UNITED STATES.

INTRODUCTION.

The wheat-growing region of the Pacific coast is located in the States of California, Oregon, Washington, and Idaho. The first impression made on the Eastern visitor by observation of the farming methods in vogue in this region is that there is a total difference between them and those to which he has been accustomed in the East. Everything relating to farming operations in this section, from the sowing of the seed to the harvesting of the crop, is at variance with the methods employed in his Eastern home, and he not infrequently makes comparisons in favor of what he terms the more economical and thrifty style of farming in his own part of the country; but, on closer investigation, he becomes convinced that Eastern methods and policies will hardly fit the conditions as they exist on the Pacific coast. Methods which give the very best results in the East would often be totally worthless on the Pacific coast, and consequently, owing to its peculiar natural conditions and resources, the Pacific coast region has a farming system which is distinctively its own.

SIZE OF FARMS.

In the first place, much of the agricultural land of the section is in large individual tracts, and although the tendency for the past twenty-five years has been toward a gradual reduction in the area of individual farms and ranches, they are still of a size much larger than the average farm of the East or even of the Middle West. This is particularly true in California, where ownership of lands in large tracts developed during the early days of American occupancy, and at a time when there was very general doubt as to the possibility of raising a crop except where irrigation was possible, and agricultural land values were, therefore, so low that it was very easy to acquire a large area of land at an almost nominal figure.

As the population increased more attention was paid to the raising of food crops, and it soon became apparent that in years of abundant rainfall a crop of grain was an exceedingly profitable investment, and, indeed, the yield was often so abundant that, at the prices then prevailing, the crop of one season not infrequently paid for the land and often enriched the owner as well.

At that time, as before stated, it was a comparatively easy matter

to secure a large tract of land, and therefore there was no occasion for the Eastern policy of maximum production on minimum area, it being decidedly easier and less expensive to secure a large holding for a wheat farm or for cattle grazing than to thoroughly cultivate a single acre, and for this reason a considerable portion of the section was soon divided into large holdings.

For the last quarter of a century, however, other ideas have prevailed, and there has been a gradual tendency toward the diversification of crops and the disintegration of the large individual tracts; consequently, it is now possible to purchase good improved land in farms of reasonable size. Notwithstanding the fact, however, that the tendency has been toward smaller holdings, there are still vast tracts of extremely fertile land in this section which can be profitably handled only as large farms.

These lands in their natural state possess qualities of soil which render them adaptable to the growth of wheat and other cereal crops, the low prices for which make necessary the most economical methods of production, and, until the existing conditions are modified by the irrigation of these areas, permitting the cultivation of crops of a more profitable nature, it might not be remunerative to divide these holdings.

FARMING FOR SINGLE CROPS.

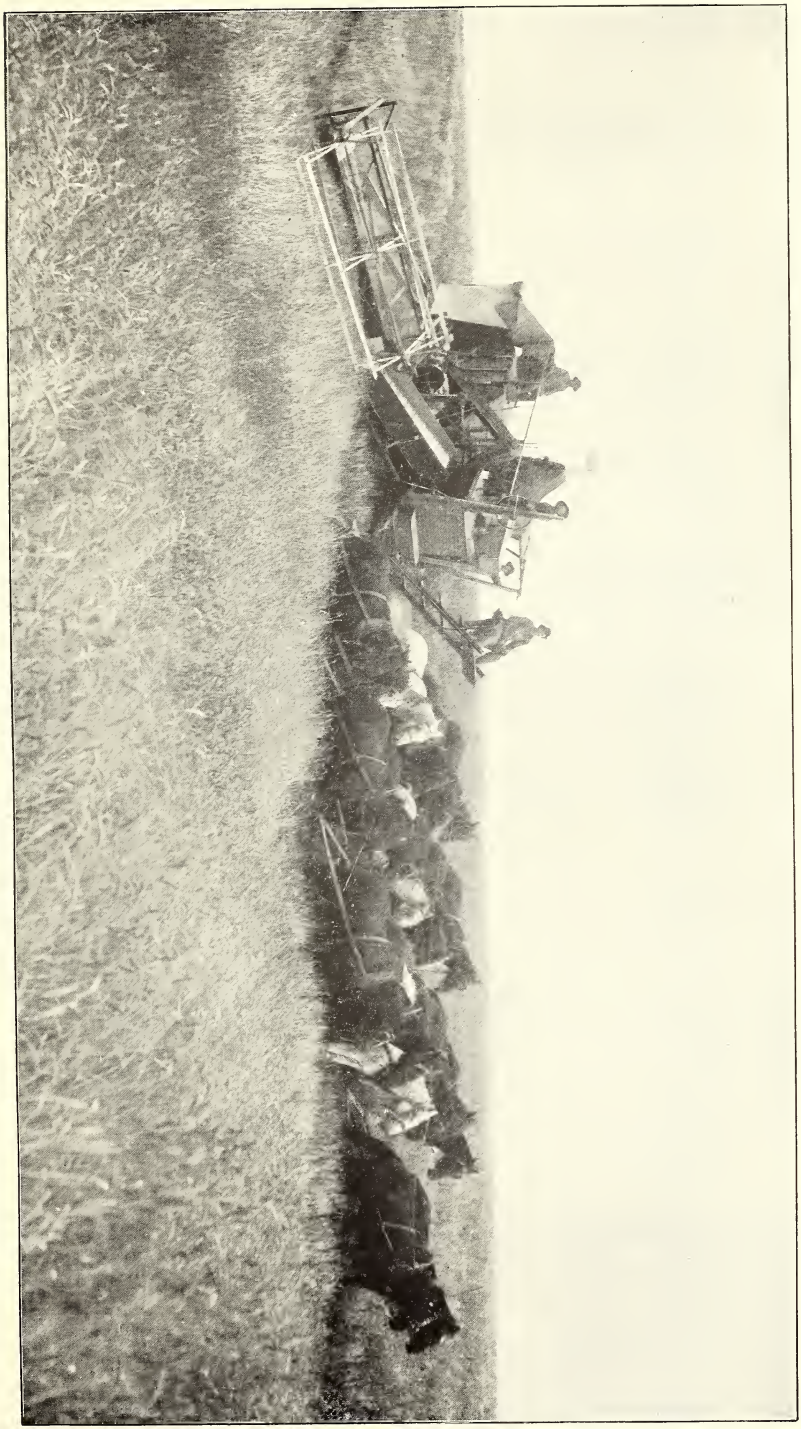
Another marked feature of this region is the farming of large areas for a single product. This is especially true of the wheat farms, where this cereal is raised exclusively, without fertilization except that which is naturally obtained by renewing the land by the process of summer fallowing. In this territory no good crops for rotation are available, and the limited precipitation of rain prohibits the planting of a fertilizing crop.

NONPRODUCTION OF FOOD.

The nonproduction of household supplies on the farm and the consequent purchase of such commodities, often in a distant market at high prices, is another characteristic of the entire Pacific coast region, although the tendency now is, as it has been for some years, toward a greater production of foods for home consumption.

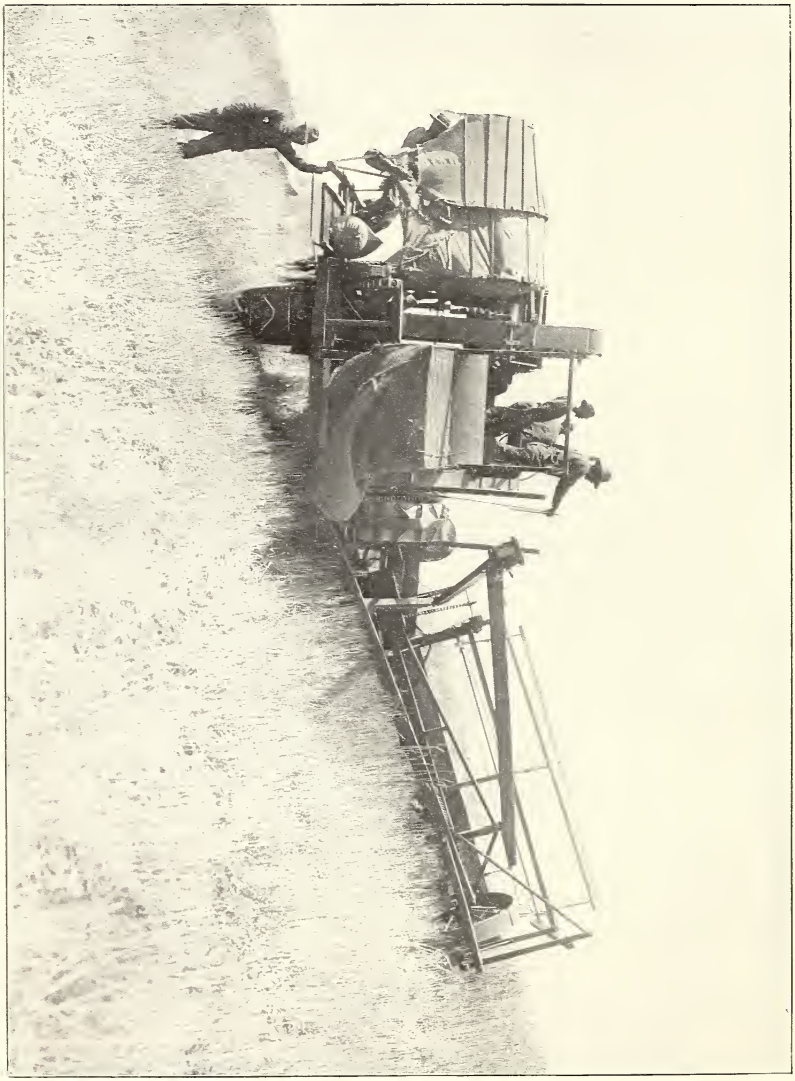
FARM MACHINERY.

The use of machinery of great capacity, which means an economy of human labor, but which often means a waste of grain, is another distinctive feature of this region, particularly in the great valley areas of California. Everything in the machinery line has always been on a large scale. Plows are set in gangs, reapers and headers are built with cutting bars of unusual length, and every effort is made to combine several operations into one, thus enabling one man to plow and cultivate the greatest possible area of land with as many horses as he can control.



STANDARD COMBINED HARVESTER IN OPERATION.

[Photographed by Mr. P. E. Holt.]



REAR VIEW OF COMBINED HARVESTER WORKING ON SIDE HILL.

[Photographed by Mr. P. E. Holt.]

The broad level fields of the grain country, particularly in the great valley of the Sacramento and San Joaquin rivers, favor the use of the most ponderous and complicated machinery; and this fact has led to the introduction of the combined harvester, by the use of which it is possible for three or four men to control the strength of twenty-four to thirty-six horses in cutting, thrashing, recleaning, and sacking grain, the several operations being accomplished as rapidly as the horses can pull the machines over the ground. (See Pl. I.)

DISPOSAL OF STRAW.

The practice of burning the straw in the field, which is generally resorted to in many localities in this region, is made necessary by the fact that it can not be plowed under and absorbed by the light soil, owing to the lack of sufficient moisture; and for this reason also it can not be rotted in the stack, while the scarcity of cattle precludes its use for feeding.

Burning also saves the ash ingredients for the land, and therefore aids in its fertilization. The nitrogen element is, however, unfortunately lost. At the same time the field is cleared of Hessian flies and other insect pests, which are as a consequence practically unknown in this section of the country.

FARM BUILDINGS.

The character of the farm buildings in the Pacific coast region has greatly improved during the past few years, the homes in the section devoted to the cultivation of fruit showing the most marked improvement. In the matter of barns and outbuildings, there is still much to be desired, but it should be remembered that in a large portion of this country the climate favors an all-the-year outdoor life for farm animals, and although some protection is needed in the more northern portions, it will never be necessary or economical to erect such buildings as are essential to the welfare of stock in a climate where severe winters are the rule.

TEMPERATURE AND RAINFALL.

The Pacific coast territory of the United States extends from a short distance above the Straits of Fuca on the north to about San Diego on the south, and covers 16 degrees of latitude—the same degrees of latitude on the Atlantic coast covering the country between the Gulf of St. Lawrence and Charleston, S. C. While the difference in temperature between the northern and southern limits of the Pacific coast is very much less pronounced than it is on the Atlantic seaboard, the differences in methods of conducting farming operations, made necessary by the extreme variation in rainfall, are far greater than those existing along the entire length of the Atlantic coast.

On the Atlantic coast from Nova Scotia to the southern limit of Florida a humid climate with abundant warm summer rains prevails

during the crop-growing season, and is seldom departed from; and as a consequence the farmer is governed in his operations almost exclusively by the conditions of temperature. This is also the case in the northern section of the Pacific coast region. In Oregon, Washington, and the more northern portion of California, extending southward into California to about Mount Shasta, abundant and heavy rainfalls may be expected throughout the entire crop-growing season.

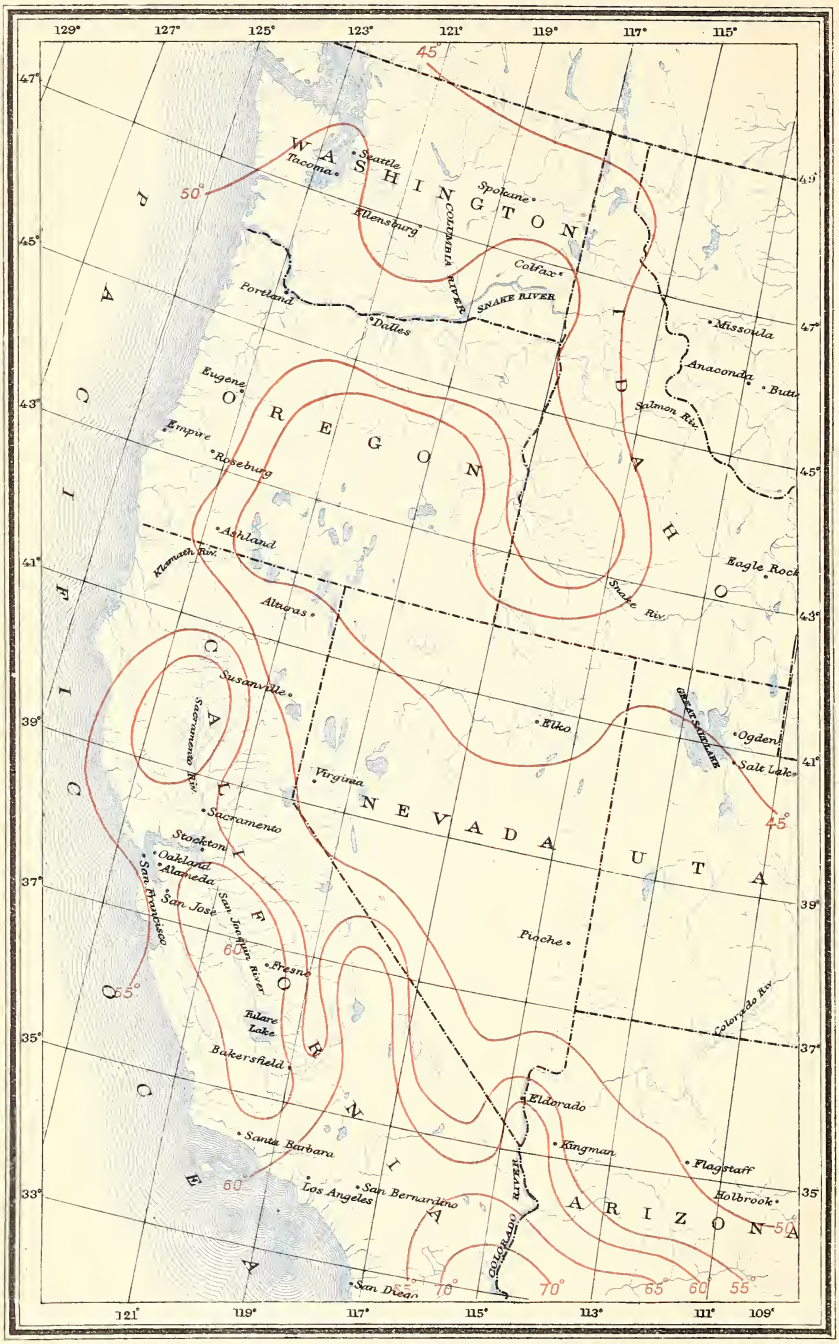
At Mount Shasta, however, the region of heavy rainfall practically ceases. It is at this point that the peculiar rainy season of the Pacific coast (November to May) begins to be noticed. Around Mount Shasta as many as 108 inches of rainfall have been recorded in one year, all occurring, however, within a comparatively short period during the winter season, scarcely any rain falling from June to October. This is practically the northern limit of the region of dry summers, which embraces by far the larger portion of the State of California and practically all of its wheat area.

In Washington the average annual rainfall varies from 110 inches on the shore line to less than 10 inches in the Yakima Valley on the eastern side of the Cascades. The area of heavy rainfall is coextensive with the western coast of the State in latitude, and runs eastward to the summit of the Olympic and Cascade ranges. The rainfall of the Puget Sound basin varies from 54 inches at Olympia to 22 inches at Port Townsend, the northern extremity.

In Oregon, as in Washington, the area of heavy rainfall is found on the coast, decreasing slightly from north to south. In the lower and middle Willamette Valley the annual precipitation of rain is about 46 inches, and decreases slowly to the southward, being 35 inches over a considerable portion of Douglas County and a less amount in the mountainous region in the southern tier of counties. On the eastern slope of the Cascades the fall is about 20 inches, and over the greater portion of the plateau region of central and eastern Oregon it is between 10 and 15 inches, rising to about 20 inches in the northeastern corner of the State.

In Idaho the precipitation in the mountain regions is upwards of 40 inches per annum. The fall on the plains, however, is not, as a rule, sufficient for the needs of agriculture, but in the foothills region and in the lower end of the Palouse Valley the rainfall is generally ample for the wheat crop. The distribution throughout the year is similar to that of the Pacific coast proper.

Along the Pacific coast proper Cape Mendocino bears the reputation of a kind of water divide, and marks the region where the character of the vegetation begins to change rapidly from that of Oregon to that of middle California. At this cape the rainfall reaches an annual mean of about 51 inches. A short distance south, at Point Arena, it is but 20 inches; and, rising slightly at San Francisco, it falls to 16.1



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MAP SHOWING ANNUAL NORMAL TEMPERATURE IN THE PACIFIC COAST STATES.

inches on the Bay of Monterey, 17.7 at Santa Barbara, and 9.7 at San Diego.

An even more rapid decrease in precipitation than this is noted in the great interior valley of California. From 36.6 inches at Redding, its extreme northern end, and 24.4 inches at Red Bluff, 24 miles south, the annual mean falls to about 19.9 inches at Sacramento and 13.2 at Stockton. Thence southward, it decreases to 10 inches at Merced, 9.3 at Fresno, and about 4 inches at the southern end of the San Joaquin Valley, a point near Bakersfield. These rainfalls of 20 inches and less would be considered insufficient for the raising of a crop in the East, and distributed over the greater part of an ordinary year they would be totally inadequate for the growing of cereals and most other crops even in this region; but, since nearly the whole of it usually falls within a period of seven months (November to May) and by far the greater part within the three winter months, during which a growing temperature for all hardy crops prevails and the wheat crop makes its principal growth, it becomes perfectly feasible to mature grain and other field crops before the beginning of the rainless summer, provided only that a reasonably favorable distribution of this limited amount of rainfall has been made.

Tables 1 and 2 show the mean temperature and normal precipitation at certain principal points in this territory for each month of the year:

TABLE 1.—*Monthly and annual normal mean temperature at certain stations in the Pacific coast States.*

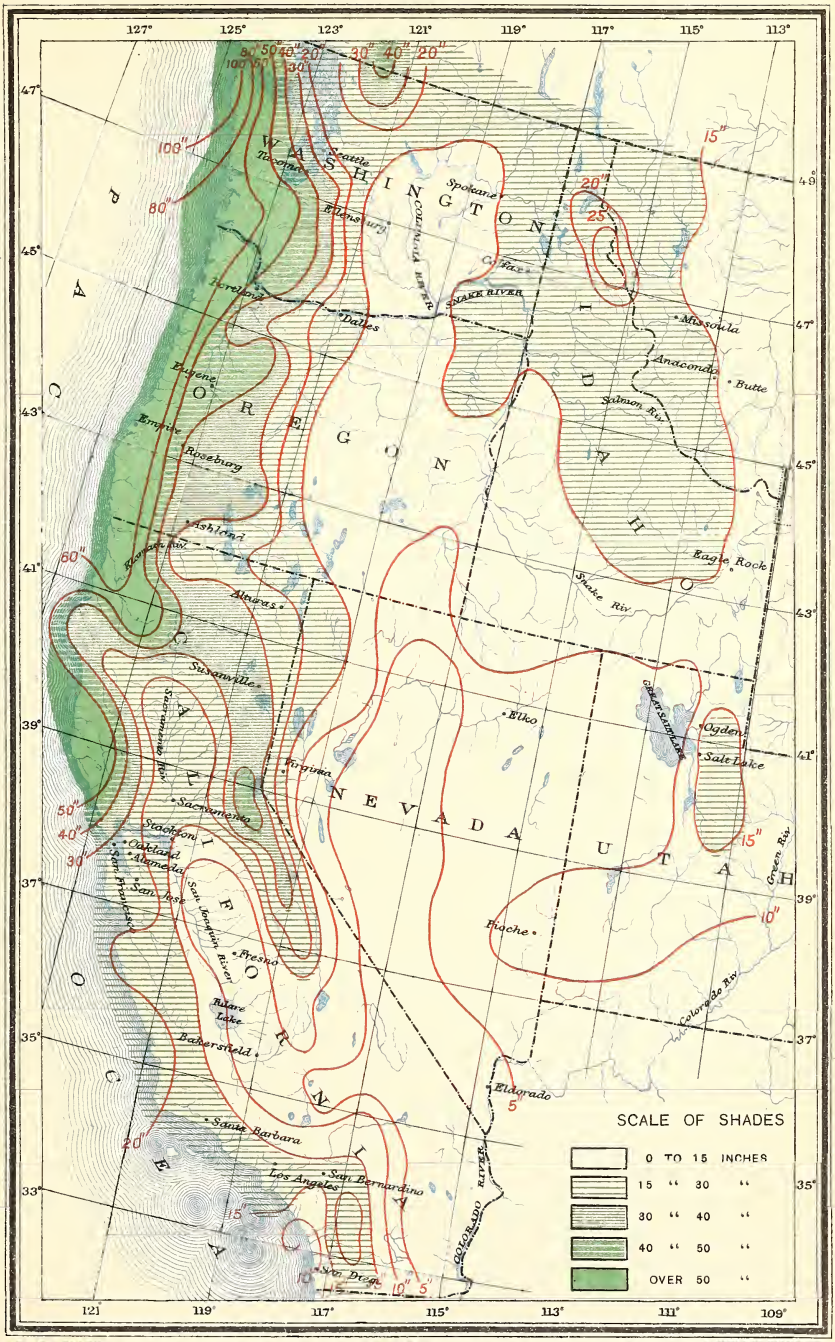
[Table furnished by United States Weather Bureau.]

States and stations.	Latitude.		Longitude.		Elevation.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Year.	Length of record.
CALIFORNIA.	°	′	°	′	*Feet.*	°*F.*	°*F.*	°*F.*	°*F.*	°*F.*	°*F.*	°*F.*	°*F.*	°*F.*	°*F.*	°*F.*	°*F.*	°*F.*	*Years*
Eureka	40	48	124	11	29	46.3	46.2	48.6	49.6	52.7	54.7	55.8	56.5	55.4	53.2	50.6	47.8	51.4	10
San Francisco	37	48	122	26	26	50.1	51.7	53.6	54.6	56.6	58.4	58.3	58.7	60.4	59.3	56.3	51.4	55.8	24
San Luis Obispo	35	18	120	39	215	51.1	54.3	55.2	56.8	59.0	62.4	64.7	64.8	63.4	62.0	57.0	53.4	58.7	8
San Diego	32	43	117	10	36	53.6	54.8	56.0	58.3	60.4	64.1	67.1	68.9	67.0	63.2	58.6	55.8	60.7	21
Red Bluff	40	10	122	15	311	44.9	49.0	54.5	59.3	67.0	74.6	81.8	81.1	73.8	63.5	53.9	46.7	62.5	18
Sacramento	38	35	121	20	35	45.6	49.8	54.7	58.2	63.5	68.6	72.6	72.7	69.5	61.8	53.5	47.1	59.8	18
Fresno	36	43	119	49	293	44.5	50.2	54.5	60.8	68.0	74.0	81.5	81.7	74.5	64.9	55.4	46.3	63.0	8
Los Angeles	34	03	118	15	278	53.1	54.4	56.3	58.9	62.1	65.7	69.3	70.4	68.5	63.7	59.2	55.4	61.4	17
OREGON.																			
Portland	45	32	122	43	43	38.4	41.2	47.2	51.6	57.3	61.6	66.3	65.9	60.7	53.4	45.6	41.5	52.5	24
Baker City	44	50	117	50	3,447	22.8	25.0	35.5	44.6	52.7	56.7	66.0	66.1	55.8	48.1	36.8	28.5	44.9	7
Roseburg	43	13	123	20	498	40.3	42.1	47.7	51.2	56.9	61.0	66.3	66.2	60.9	52.7	45.2	42.0	52.7	18
WASHINGTON.																			
Olympia	47	03	122	53	19	37.8	39.3	44.4	48.3	54.6	58.9	62.2	62.3	56.6	49.9	44.4	40.6	49.9	18
Spokane	47	40	117	25	1,895	25.4	28.5	39.7	48.0	57.0	62.4	69.0	69.0	58.1	48.0	37.8	31.3	47.8	14
Walla Walla	46	02	118	20	969	30.5	35.4	45.5	53.3	60.9	65.6	74.0	74.2	63.9	54.0	43.0	37.7	53.2	10
IDAHO.																			
Fort Sherman	47	45	116	46	.....	25.2	27.0	37.7	45.9	54.0	60.5	67.0	66.4	56.2	46.8	36.6	30.8	46.3	12
Boise City	43	37	116	08	2,880	27.8	35.0	44.2	51.2	58.4	65.9	72.9	72.0	61.4	50.4	39.2	32.2	50.9	13
Idaho Falls	43	29	112	04	4,714	16.1	20.0	31.3	43.8	52.3	60.0	68.3	67.6	57.5	45.0	30.0	23.0	42.9	20

TABLE 2.—*Monthly and annual normal rainfall in the Pacific coast States.*

[Table furnished by United States Weather Bureau.]

States and stations.	Latitude.	Longitude.	Elevation.	Record.		Whole years.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.		
				From—	To—														Mean.	Extremes.	
																				Highest.	Lowest.
CALIFORNIA.																					
Coast.	° ′	° ′	*Feet.*				*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*
Crescent City	41 45	124 12	50	1885	1896	11	13.1	8.9	9.1	7.1	4.5	2.0	0.4	0.1	1.8	4.4	8.8	13.9	71.0	82.2	47.5
Fort Humboldt	40 46	124 10	50	1854	1896	28	6.6	5.2	5.4	3.5	1.7	0.7	0.1	0.1	0.8	2.1	3.8	7.1	37.1	60.4	21.9
Mendocino	39 18	123 48	.....	1871	1890	14	10.0	8.7	7.2	4.5	1.3	0.4	0.1	T.	0.6	2.8	6.5	9.3	51.5	75.3	26.0
Fort Ross	38 35	123 05	.....	1874	1896	20	12.0	6.8	7.3	4.2	1.8	0.7	0.1	T.	0.8	2.8	6.8	8.8	52.2	88.0	23.6
San Francisco	37 48	122 26	60	1849	1896	47	5.0	3.5	3.1	1.9	0.7	0.1	T.	T.	0.2	0.9	2.8	5.2	23.4	38.7	12.0
Santa Cruz	36 58	122 02	25	1873	1896	20	5.4	4.0	3.6	2.4	1.0	0.2	T.	T.	0.5	1.7	3.1	5.3	27.2	44.9	16.8
Monterey	36 37	121 52	40	1847	1896	21	2.9	2.5	2.8	1.5	0.6	0.1	T.	T.	0.1	0.6	1.5	3.5	16.1	28.6	8.3
San Luis Obispo	35 18	120 39	270	1869	1896	24	4.8	3.6	3.2	1.8	0.3	0.1	T.	T.	0.2	1.1	1.9	4.4	21.4	50.0	12.2
Santa Barbara	34 25	119 40	20	1867	1896	29	3.8	3.4	2.3	1.3	0.4	0.1	T.	T.	0.1	0.7	1.7	3.9	17.7	38.8	8.1
San Diego	32 42	117 14	150	1850	1896	47	1.7	1.9	1.4	0.7	0.3	0.1	0.1	0.1	0.1	0.3	1.0	2.0	9.7	27.5	2.9
Great Valley.																					
Redding	40 36	122 27	565	1874	1896	22	7.7	4.3	4.8	3.2	2.2	0.5	0.1	0.1	0.6	2.2	3.6	7.1	36.6	62.3	18.4
Red Bluff	40 10	122 15	342	1872	1896	25	4.5	3.5	2.9	2.0	1.2	0.4	0.1	T.	0.6	1.4	3.0	4.8	24.4	49.1	12.7
Marysville	39 09	121 35	69	1871	1896	24	3.4	2.7	2.3	1.6	0.9	0.3	T.	T.	0.3	1.0	2.0	3.7	18.2	33.8	11.2
Sacramento	38 35	121 30	64	1849	1896	47	3.9	2.8	2.9	1.9	0.8	0.1	T.	T.	0.2	0.7	2.1	4.5	19.9	34.8	8.4
Stockton	37 58	121 15	20	1853	1896	31	2.6	1.9	1.8	1.3	0.6	0.1	T.	T.	0.2	0.5	1.3	2.9	13.2	22.6	3.0
Fresno	36 44	119 48	295	1877	1896	19	1.5	1.3	1.4	1.2	0.4	0.1	T.	T.	0.2	0.4	1.0	1.8	9.3	18.0	5.7
Tulare	36 13	119 19	289	1874	1896	22	1.4	1.1	1.1	0.8	0.4	0.1	T.	T.	0.1	0.3	0.5	1.2	7.0	13.7	4.2
Los Angeles and San Bernardino plains.																					
Los Angeles	34 03	118 12	330	1872	1896	24	3.8	3.4	2.5	1.1	0.4	0.1	T.	0.1	0.1	0.7	1.5	3.6	17.2	40.5	5.6
San Fernando	34 16	118 26	1,066	1877	1891	14	2.4	3.2	2.7	1.6	0.4	0.1	T.	T.	0.1	0.7	1.4	3.2	16.0	37.0	5.4
San Bernardino	34 06	117 18	452	1870	1896	25	3.5	2.9	2.6	1.4	0.5	0.1	T.	0.2	0.1	0.6	1.5	3.2	16.6	37.2	5.6
OREGON.																					
Astoria	46 11	123 48	38	1850	1896	34	12.3	8.5	9.2	5.7	3.8	3.1	1.2	1.4	3.4	5.6	10.5	12.3	77.0	100.5	49.4
Portland	45 32	122 43	80	1870	1896	27	7.0	5.9	5.5	3.4	2.5	1.8	0.5	0.6	1.6	3.7	6.1	7.6	46.2	67.2	30.8
Cascade Locks	45 40	121 50	150	1879	1896	16	12.9	9.9	7.2	6.5	3.7	2.6	0.9	0.6	3.7	7.2	9.7	14.4	79.3	100.6	56.2
The Dalles	45 33	121 12	106	1850	1896	28	3.7	2.3	1.9	0.8	0.8	0.5	0.2	0.2	0.9	1.3	2.7	3.6	18.9	43.7	11.9
Bandon	43 05	124 30	40	1878	1896	19	12.6	8.7	7.7	5.9	3.9	1.8	0.6	0.5	2.7	5.2	6.9	12.2	68.7	104.0	47.7



C. C. CLARK.

A. HOEN & CO. BALTIMORE.

MAP SHOWING ANNUAL NORMAL RAINFALL IN THE PACIFIC COAST STATES.

Roseburg	43	13	123 20	523	1877	1896	19	6.3	4.8	3.6	2.7	2.1	1.2	0.4	0.3	1.1	2.7	4.0	6.4	35.6	46.9	22.4
Klamath, Fort	42	41	121 50	4,200	1864	1889	13	3.3	2.5	2.5	1.6	1.2	0.8	0.4	0.3	0.5	1.6	3.3	3.5	21.5	30.6	9.6
Harney, Camp	43	00	119 00	4,600	1867	1880	11	1.5	1.1	1.3	1.0	0.9	0.8	0.3	0.2	0.2	0.5	1.4	1.6	10.8	18.2	4.7
WASHINGTON.																						
Neah Bay	48	22	124 37	40	1863	1896	15	16.4	12.3	11.7	7.6	5.2	5.0	2.2	2.5	6.9	9.5	14.3	16.4	109.7	136.0	79.6
Olympia	47	03	122 53	36	1877	1896	18	8.1	6.7	5.0	4.0	2.7	1.6	0.7	0.7	2.8	4.7	7.7	9.8	54.5	73.4	33.6
Ellensburg	47	00	117 32	1,500	1884	1896	7	1.6	0.7	0.5	0.9	0.9	0.3	0.3	T.	0.5	0.4	1.4	1.5	9.0	11.8	6.7
Colville, Fort	48	43	117 50	1,963	1859	1880	13	2.4	1.6	1.6	1.0	1.8	1.5	1.3	0.6	0.6	1.1	1.9	1.8	18.8	32.7	8.4
Spokane	47	40	117 25	1,909	1881	1896	15	2.5	1.9	1.4	1.4	1.5	1.6	0.7	0.4	1.0	1.6	1.9	2.7	18.6	25.7	13.5
Walla Walla	46	02	118 30	930	1857	1896	27	1.6	1.4	1.5	1.4	1.7	1.2	0.5	0.3	0.8	1.4	1.7	1.9	15.4	23.1	7.1
IDAHO.																						
Fort Sherman	47	42	116 38	2,198	1881	1896	13	3.7	2.3	2.2	1.8	2.0	1.4	0.5	0.4	1.3	1.9	3.5	3.5	24.5	38.0	14.1
Murray	47	33	115 52	.....	1893	1896	3	6.4	3.0	3.1	2.5	4.4	1.9	0.6	0.8	3.2	2.2	6.6	4.4	39.1	43.1	29.8
Boise City	43	34	116 08	2,768	1864	1896	27	2.3	1.4	1.7	1.3	1.6	0.8	0.2	0.2	0.4	0.9	1.3	2.1	14.2	25.8	6.7
Idaho Falls	43	30	112 04	4,781	1880	1896	6	2.2	1.7	2.0	1.5	1.2	1.1	0.5	0.6	0.7	1.0	1.2	1.5	15.2	21.3	8.6

POPULATION.

This portion of country contained in 1890 a population of 1,955,672, of which 1,208,130, or 61.8 per cent, were in California; 313,767, or 16 per cent, in Oregon; 349,390, or 17.9 per cent, in Washington, and 84,385, or 4.3 per cent, in Idaho. On June 1, 1900, the aggregate population of the Pacific coast States had increased to 2,578,464, a total gain of 622,792 persons during the decade, amounting to 31.8 per cent.

California, the largest State of the group in both area and population, shows the smallest relative increase, having gained but 276,923, or 22.9 per cent, during the decade. Oregon follows, with an increase of 99,769, or 31.8 per cent. Washington comes next, with 168,713, or 48.3 per cent, and Idaho, by far the smallest State of the group, nearly doubled its population during the period, and shows an increase of 77,387, amounting to 91.7 per cent.

While the relative order of the States has remained unchanged with regard to population, the proportion of the total population of the Pacific coast States represented by that of each State has changed considerably during the past ten years. California now has 57.6 per cent of the total, Oregon 16 per cent, Washington 20.1, and Idaho 6.3, California having lost slightly, Washington and Idaho both showing gains, and Oregon just about holding its own.

According to the returns of the Eleventh Census, there were in these States, in 1890, 218,372 persons engaged in agricultural occupations. Similar data for 1900 are not yet available, and therefore an estimate based on the proportions existing in 1890 has been made, which, while it is probably not absolutely correct, is, nevertheless, sufficiently accurate for comparative purposes.

This estimate shows that of the 2,578,464 persons residing in this section of the country in 1900, 290,724, or 11.3 per cent, were engaged in agricultural occupations. They are distributed as follows: 152,805, or 52.6 per cent, in California; 57,945, or 19.9 per cent, in Oregon; 54,862, or 18.9 per cent, in Washington, and 25,112, or 8.6 per cent, in Idaho.

There are vast areas of unimproved lands capable of and awaiting cultivation in this section, much of which, while possessing qualities of soil and climate which render them especially adaptable to the production of fine crops, can be purchased at a comparatively low figure and on long time. The attention of immigrants and Eastern farmers has been attracted to these lands, and an increase in agricultural population has been the natural result. On account of the possible profit in the improvement of this uncultivated land, a growth in population during the next ten years even greater than that of the past decade would not be remarkable.

Table 3 shows the total population and the number of persons engaged in agricultural occupations in each of the Pacific coast States in 1890 and 1900:

TABLE 3.—*Population of the Pacific coast States in 1890 and 1900.* [1]

States.	1890.		1900.	
	Total.	Agricultural.	Total.	Agricultural. [2]
California	1,208,130	124,311	1,485,053	152,805
Oregon	313,767	43,965	413,536	57,945
Washington	349,390	36,997	518,103	54,862
Idaho	84,385	13,099	161,772	25,112
Aggregate	1,955,672	218,372	2,578,464	290,724

[1] Persons 10 years of age and over engaged in agricultural occupations for gain constitute the agricultural population.
[2] Estimated.

WAGES OF FARM LABOR.[1]

During the past thirty-five years ten separate investigations with regard to the rates of wages paid for farm labor in the United States have been made by the Department of Agriculture. For the whole of the United States the most important facts ascertained are those relating to monthly wages, both with and without board, for the year, owing to the fact that farm hands thus paid constitute the greater proportion of the agricultural laborers of the country. In the Pacific coast country, however, the wages paid for transient labor would probably be of more importance, as there is a far greater proportion of this class of labor utilized in this region than in any other part of the United States.

Of the transient labor employed in the wheat fields the most important, of course, is that employed during the harvest period, and wages paid to farm laborers at that time are correspondingly higher than those paid at any other season of the year. As a general rule, wages are relatively higher on the Pacific coast than in any other section of the country, largely on account of the great number of transients employed, and also for the reason that in this particular region agriculture is exceedingly profitable, when proper methods are pursued, the soil and climate of a large portion of this region being particularly well adapted to the growth not only of cereals, but also of fruits, nuts, and vegetables of all kinds.

The difference between wages with and without board at the various dates covered by the several investigations affords an opportunity for interesting study. This difference, naturally, stands practically for the cost of board and represents the numerous variations in prices of products consumed by the average farm laborer. Comparing these

[1] All wage rates are in gold.

equivalents for board in 1866 and 1899, we find that both the cost of living and the rate of wages decreased.

In California there was a decrease in cost of living from $15.36 per month in 1866 to $11.23 in 1899, and in Oregon the decrease was from $13.22 in 1866 to $8.34 in 1899. It is impossible to make similar comparisons for the other two States, as no statistics were obtainable for those States in 1866.

Not only do marked differences exist between the several States of this group, as shown by table 4, but in the different sections of each State there are great variations in the rates of wages, which may be accounted for in various ways. One reason, and perhaps the principal one, ascertained by careful inquiries, is well brought out by the higher price paid for labor in the neighborhood of large cities, where the density of population results in high rents and a demand for skilled labor in gardening and fruit growing, as well as in general farming, and the relatively high range of prices which such skilled labor commands produces a natural competition which has a tendency to raise wages.

In a portion of a State marked by high intelligence and the general education of its people farm wages are relatively high, because more is demanded of the farm laborer. A greater variety of production is necessary, and the service of the laborer of that class is more effective and consequently more valuable. In other sections, distant from the market, with poor railway facilities and bad roads to railway stations, the demand for labor, especially that of a high class, is less, and the products of such labor are consequently less valuable. As a natural result, there is less skill and ambition among laborers in such localities, as the more progressive laborer will usually seek a section of the country where he can obtain wages that will more nearly compensate him for the energy and skill which he applies to his work.

The Pacific coast section of the country has been at different times more or less affected by mining developments, which have caused labor competitions and increased the demand for, and consequently the price of, all food products; and there was also a considerable increase in the wages of farm labor.

It has been possible to obtain complete data in regard to farm wages for but two of the Pacific coast States (California and Oregon). In the other two States the earliest period for which such figures are available, except in the case of wages per day during harvest, is 1885 in Washington and 1886 in Idaho. In California and Oregon, however, complete returns have been made for all of the years covered by the several investigations. In the former State monthly wages by the year, with board, decreased from $30.35 in 1866 to $25.64 in 1899; and there was a corresponding decrease in wages, without board, from $45.71 in 1866 to $36.87 in 1899. The average rate paid per day to

farm laborers during harvest in this State, with board, in 1866 was $2.06; this, with some fluctuations, decreased to $1.63 in 1899.

Where the farm hand boarded himself the wage rate was 50 cents higher in 1866 than was the case where board was furnished by the employer, thus making a total daily wage rate of $2.56 in 1866, which decreased to 1.96 in 1899. For the remainder of the year $1.72, with board, was paid in 1866 and $1.10 in 1899, a decrease during the period of 62 cents. For the same class of labor, without board, $2.26 was paid in 1866 and $1.51 in 1899.

In Oregon the average monthly wages for continuous service by the year, with board, in 1866, was $22.53. This increased, however, to $25.67 in 1875, which is the highest rate paid during the entire period, and decreased to $22.89 in 1899.

The wages without board show a similar fluctuation, increasing from $35.75 in 1866 to $38.25 in 1875, with a final decrease to $31.23 in 1899. In harvest, $1.80 a day with board was the amount commonly paid for farm labor in this State in 1866, and this gradually decreased to $1.47 in 1899.

A corresponding decrease is shown in the rate of wages without board during this period, the decrease being from $2.40 in 1866 to $1.82 in 1899. For the period other than the harvest period, $1.40, with board, per day was paid in 1866 and $1 in 1899. Where board was not furnished the wage rate was increased to $1.75 in 1866 and $1.35 in 1899.

The compensation paid to overseers or foremen in the Pacific coast States ranges from $45 per month in Oregon and Washington to $50 per month in California and Idaho, board being furnished by the employer. Where board is not furnished the wage rate is about $15 per month higher than this.

It will be noted in table 4 that in each State and in every wage rate, whether by the year or during harvest, with board or without board, a steady increase was made from 1895 to 1898. This is doubtless largely due to the effect of the recent gold excitement in the Klondike and other northwestern sections of the country, which drew away large numbers of agricultural laborers, particularly from the Pacific coast region.

No complete investigation of the wages paid farm labor has been made since 1899, but inquiries of the principal farmers in this section during the early days of the present year have developed the fact that there has been a corresponding decrease in wages paid all classes of farm labor since 1899, and this is possibly due in a large measure to the abatement of the gold excitement and the return of many of the agricultural laborers who sought wealth in the gold fields.

The first of the series of official investigations into the rates of wages paid for agricultural labor was made in 1866, and complete data

for any of the States are not available for an earlier period; but there are in existence in many districts local records, kept generally by the more careful and methodical farmers, which will throw considerable light upon the rates paid for farm labor in earlier years; and with that object in view the following notes, compiled from a former publication of the Department of Agriculture,[1] are presented:

CALIFORNIA.

Trinity County.—I employed from 5 to 10 farm hands on the Souden ranch from 1851 to 1863, at wages ranging from $40 to $60 per month, with board, the average wages being about $45 per month.

Marin County.—In 1855 wages of farm hands were $40 per month, with board, but dropped to $30 by 1865 and since that time have declined to $25.

Contra Costa County.—In 1859 wages were from $2 to $2.50, with board, for harvest hands, and by the year for other labor from $30 to $40 per month, and there has been a remarkable uniformity in farm wages ever since.

San Mateo County.—From 1860 to 1865 wages of farm laborers would average from 50 to 100 per cent higher in this county than at present, especially for good teamsters to drive from 4 to 8 horses.

Shasta County.—In 1852 farm hands received from $75 to $100 per month, with board, or from $2.50 to $4 per day, harvest wages being $4 per day. In 1855 farm laborers received $50 per month, or $2.50 to $3 per day. In 1860 they got $35 to $40 per month, or in harvest $2 to $2.50 per day. In 1865 we could hire hands by the year for $25 to $30 per month by paying the usual price per day in harvest, namely, $2 to $2.50. All of the above figures include board.

San Joaquin County.—The first wheat was raised here in 1852, I think, and I think it safe to put the average wages the same as at present, as I can remember no change in my time here.

Sonoma County.—In 1853 farm hands received from $60 to $75 per month; in 1860, $35 to $45, all with board. These figures are for common everyday laborers. Teamsters and good dairymen received from $5 to $10 more per month.

Humboldt County.—I settled in this county in 1851, and for about the first five years the rate for farm labor, hired by the year, was from $60 to $75 per month, with board. The rate by the day in harvest was from $3 to $4, with board; that for transient work by the day being from $2 to $3, with board.

Los Angeles County.—From 1860 to 1870 laborers were very scarce, and wages were from 15 to 20 per cent higher than now. The mines of this State and the excitement attending the war drew the laborers from the farms.

Merced County.—Wages by the month have changed very little in the last twenty years, but are not quite so high as formerly.

Butte County.—From 1851 to 1865 wages per month, with board, were $30.

Mono County.—Farm wages have scaled down in the last thirty years from $60 per month, with board, to the present status.

OREGON.

Baker County.—From 1842 to 1850 the monthly rate was $12, with board; in harvest the average was about $1 per day. From 1850 to 1862 wages varied from $10 to $15 per month, and board.

Benton County.—In this county wages for farm labor (except in harvest) have gradually diminished since 1860. From 1850 to 1865 the common wages were from $2.50 to $3 per day.

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[1] Report No. 4, miscellaneous series, U. S. Dept. Agr., Division of Statistics, Wages of Farm Labor in the United States.

Linn County.—The prices I have given are the prices paid for farm labor ever since 1852. Sometimes there have been variations, but these have been the general rule.

Washington County.—In 1853 monthly wages were $50 without and $40 with board; harvest wages $2.50 per day without and $2 with board. Other transient labor cost $1.50 per day without or $1.25 with board. In 1854 the rate per month was the same as in 1853, and the daily wages of each class about 25 cents a day less than in that year. Little variation up to 1865.

Marion County.—From 1840 to 1850 the average wages for farm hands, with board, were about $450 per year.

Morrow County.—From 1861 to 1865 wages on farms were $30 per month by the year, or $1.25 per day, harvest wages being $2 per day. All these are the rates with board.

Coos County.—From 1860 to 1870 wages were $2 per day for all farm work, with board.

Union County.—In 1864 and 1865 the rate was from $25 to $30 per month.

Table 4 shows the results of the several investigations with regard to the average wages paid for farm labor in the States of the Pacific coast country from 1866 to 1899:

TABLE 4.—*Farm wages in the Pacific coast States, 1866 to 1899.*

[All wage rates in gold.]

WITH BOARD.

Year.	California.			Oregon.			Washington.			Idaho.		
	By year.	In harvest.	Other than harvest.	By year.	In harvest.	Other than harvest.	By year.	In harvest.	Other than harvest.	By year.	In harvest.	Other than harvest.
	Per month.	*Per day.*	*Per day.*	*Per month.*	*Per day.*	*Per day.*	*Per month.*	*Per day.*	*Per day.*	*Per month.*	*Per day.*	*Per day.*
1866	$30.35	$2.06	$1.72	$22.53	$1.80	$1.40	.....	$2.25	.....	.....	.....	.....
1869	28.69	2.04	1.50	.....	.....	.....	.....	.....	.....	.....	.....	.....
1875	28.60	2.00	1.30	25.67	1.72	1.15	.....	2.00	.....	.....	.....	.....
1879	26.27	1.76	1.23	23.86	1.54	1.08	.....	1.61	.....	.....	.....	.....
1882	23.45	1.86	1.29	24.75	1.50	1.00	.....	.....	.....	.....	.....	.....
1885	25.00	1.80	1.15	21.25	1.50	.95	$26.25	1.50	$1.17	.....	.....	.....
1888	25.67	1.85	1.18	23.00	1.45	.98	25.00	1.60	1.15	$26.25	$1.52	$1.15
1890	22.40	1.75	1.15	22.00	1.45	1.03	24.40	1.67	1.27	23.50	1.50	1.45
1892	24.50	1.70	1.17	23.00	1.55	1.05	25.00	1.67	1.38	23.50	1.55	1.18
1893	26.37	1.69	1.05	21.99	1.42	.96	24.11	1.50	1.08	27.28	1.55	1.14
1894	23.66	1.50	.97	17.41	1.18	.76	19.16	1.20	.88	22.40	1.29	.93
1895	21.36	1.36	.89	16.54	1.10	.72	17.64	1.15	.80	21.38	1.26	.92
1898	24.01	1.50	1.03	21.48	1.34	.93	22.97	1.59	1.07	26.60	1.50	1.14
1899	25.64	1.63	1.10	22.89	1.47	1.00	25.06	1.76	1.17	28.13	1.62	1.21

WITHOUT BOARD.

1866	$45.71	$2.56	$2.26	$35.75	$2.40	$1.75	.....	$3.00	.....	.....	.....	.....
1869	46.38	2.82	2.13	.....	.....	.....	.....	.....	.....	.....	.....	.....
1875	44.50	2.50	1.84	38.25	2.11	1.47	.....	2.40	.....	.....	.....	.....
1879	41.00	2.27	1.65	35.45	2.02	1.44	.....	2.15	.....	.....	.....	.....
1882	38.25	2.30	1.71	33.50	1.92	1.33	.....	.....	.....	.....	.....	.....
1885	38.75	2.20	1.57	34.00	1.95	1.30	$38.33	2.05	$1.70	.....	.....	.....
1888	38.08	2.25	1.60	32.56	1.94	1.35	35.20	2.10	1.45	$39.00	$2.00	$1.50
1890	35.50	2.10	1.55	31.60	1.90	1.38	37.00	2.10	1.60	36.25	2.00	1.63
1892	36.50	2.25	1.60	34.25	2.00	1.55	37.50	2.20	1.70	35.50	2.00	1.60
1893	38.25	2.08	1.47	30.58	1.79	1.29	35.43	1.87	1.51	37.76	1.75	1.54
1894	35.88	1.92	1.38	25.73	1.51	1.06	29.74	1.55	1.21	33.08	1.53	1.31
1895	33.30	1.75	1.29	23.79	1.37	1.00	28.37	1.46	1.14	32.15	1.56	1.30
1898	35.08	1.85	1.42	29.32	1.67	1.24	33.68	1.93	1.46	37.48	1.86	1.57
1899	36.87	1.96	1.51	31.23	1.82	1.35	36.77	2.13	1.62	39.39	2.00	1.68

AREA DEVOTED TO WHEAT.

The Pacific coast wheat region, as considered in this bulletin, embraces all of the wheat-producing lands of California, Oregon, and Washington, and the northern portion of Idaho, which is practically a continuation of the great Palouse Valley. (See Map IV.) Methods employed in cultivating and harvesting wheat in this section are radically different from those in any other section of the country; in fact, even different sections of the Pacific coast region have entirely different methods both of tilling the soil and harvesting the crop.

VARIETIES OF WHEAT RAISED.

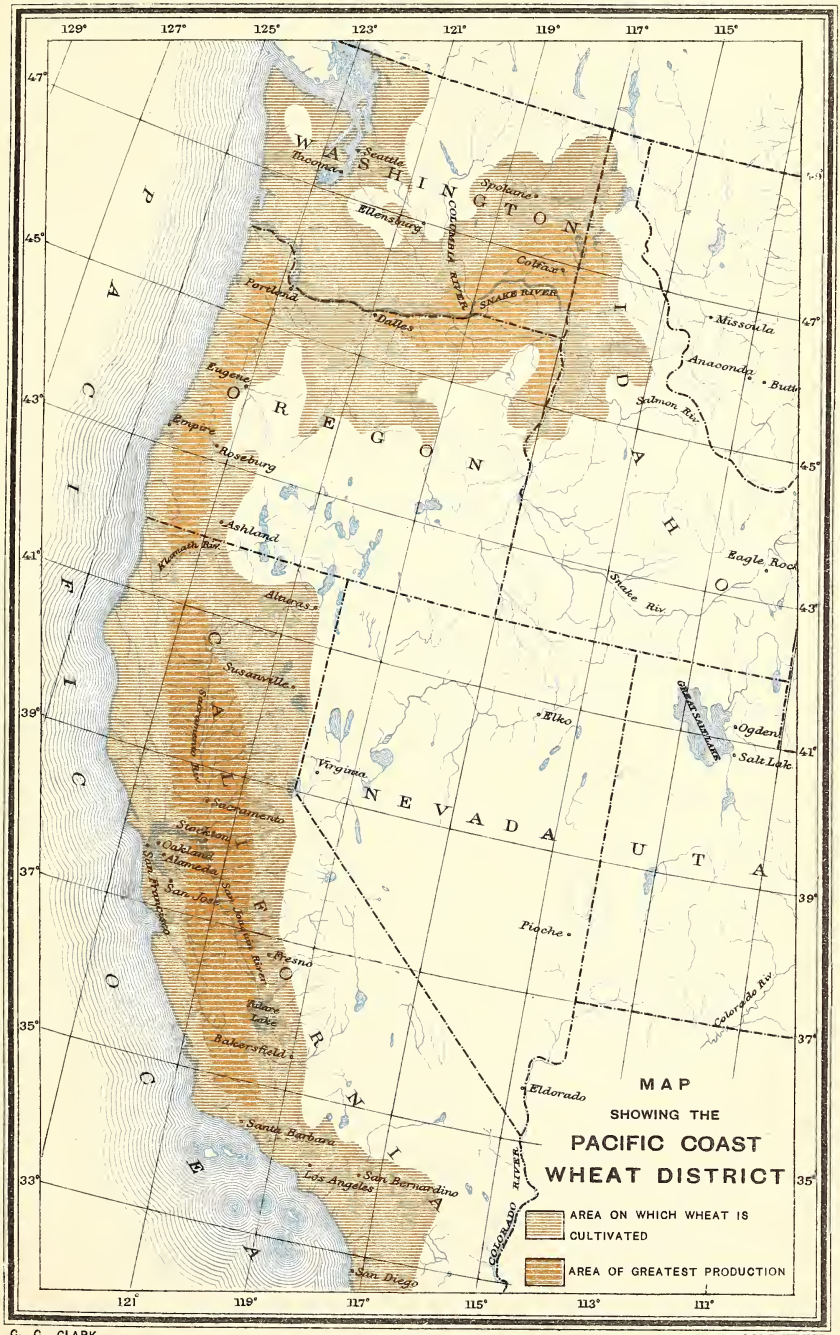
The varieties of wheat sown in this section are also entirely different from those of any other section of the country, their peculiar characteristic being a white grain, with a soft and starchy content; and conditions of soil and climate are such that even other wheats when imported for seed, although when originally planted entirely different in character from those of native growth, lose their individuality in a season or two and come to have practically all the characteristics of the standard soft white wheats of this region.

Introductions of other varieties, hard red wheat in particular, and in fact almost all of the hard wheat varieties, have been tried in this section, but it has been found that as soon as they become acclimated they partake largely of the characteristics of the native wheat of this section. The principal factor in producing grain of such character is probably the lack of humus in the soil, aided, no doubt, by the generally cool summers of this region.

A large proportion of the more common varieties peculiar to this region are of the Club Wheat group, so called on account of the peculiar club-like formation of the head. In California, Defiance and White Australian wheat are grown almost exclusively for milling purposes, and Sonora wheat for shipping. Red Chaff and Foise are the principal varieties grown in Oregon, and Palouse Blue Stem in Washington and Idaho. The ability of Club wheats to hold the grain and prevent shelling makes them especially desirable in this region of exceedingly dry summers, where the grain, after becoming fully ripe, is frequently left standing in the field for thirty to sixty days before being harvested.

SEED REQUIREMENTS.

The amount of wheat required for seed varies greatly in different sections of the country, and there is also considerable variation in the time of sowing, winter wheat being sown from September to the middle of January, and spring wheat often as late as March 15. Late-sown wheat requires a very much larger amount of seed per acre than that sown earlier in the season, so that it not infrequently



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Scale

100 0 100 Miles

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occurs that the sowing on farms in the same immediate locality will vary from 30 to 100 pounds per acre, and this great variation has rendered it practically impossible to make an accurate calculation of the amount of wheat sown per acre for the entire region; but it is probably somewhere near 70 pounds. This would indicate a total seed requirement of about 5,000,000 bushels, of which California uses a little more than 3,000,000 bushels, Oregon nearly 1,000,000, Washington about 820,000, and Idaho 121,000 bushels.

SUMMER FALLOWING.

Summer fallowing is generally practiced all over the entire region, largely owing to the fact that there is practically no rotation feasible. On a considerable portion of the area devoted to wheat in this section it is also impossible to grow a fertilizing crop to plow into the ground, as is the custom in the more humid sections of the country, as there is barely sufficient moisture for the staple crop.

The soil on the summer-fallowed land derives great benefit from the disintegration of its otherwise insoluble ingredints by the action of the air; but the chief benefit derived is from the rain of two seasons falling on the land on which one crop is to be produced. The greater portion of the wheat land of this region is capable of absorbing all the rain that falls, and the maintenance of a loose, clean surface as presented by the summer fallow prevents evaporation. In addition to this, early sowing gives the land a long growing season, with the result that a good crop is nearly always raised on land which has been treated in this manner, even though the rainfall during the growing season is scant.

Summer-fallowed land is frequently sown in May of the season following its period of idleness; where pasture is needed, the cattle are allowed to graze on the young wheat during the entire summer season, and in the fall the final growth of wheat is allowed to start. Probably half the wheat land of the entire Pacific coast region is summer fallowed each year. This gives one crop on an average every two years, but if a sufficient amount of rain falls immediately after harvest it is possible to raise two crops in three years by reseeding promptly.

No fertilization of the wheat fields other than by summer fallow has been attempted except by individual farmers or in an experimental way by the State bureaus and experiment stations, the results of which experiments have not as yet been made public.

WHEAT HAY.

The greater proportion of the feeding material used for stock in this region is hay made from barley and wheat, which is usually cut "in the milk" and cured in a manner similar to that used in curing the ordinary kinds of hay. It would be impossible to make an accurate

estimate of the amount of wheat cut for hay, as it varies each year with the condition of the grain when at the proper stage to cut, and also with the price of hay and wheat. In a year of drought, for instance, when the wheat berry is shriveled and prospects for a crop of grain are not good, a very much larger proportion of wheat is cut for hay than would ordinarily be the case; or if the price of grain is exceedingly low, or the price of hay unusually high, the proportion cut for hay would be very much greater.

Considerable alfalfa is also used for feeding in the region, but it has been found that alfalfa alone will not suffice for the working animal, while wheat hay is often largely used without the addition of any other food, and with the very best results, as the partly grown grains in the heads of the wheat hay furnish all that is necessary in the way of grain feed.

While, as before stated, it is not possible to make an accurate estimate of the amount of wheat ordinarily cut for hay, it is safe to say that probably 10 per cent of the entire wheat area of this region is usually devoted to that crop.

VOLUNTEER WHEAT.

A considerable amount of hay is often cut from wheat which has been allowed to "volunteer." It often happens in the semiarid regions that only a very small yield of grain will be secured, and if rains happen to come immediately after the harvesting of such a crop the farmer sometimes scatters a little additional wheat over the ground, without replowing, and allows it to grow as a volunteer crop. This crop is usually either pastured or cut for hay at the proper time. Not infreqently, however, the prospective wheat yield is sufficient to warrant its being allowed to mature as grain, and instances are not uncommon where yields have been as high as 25 to 30 bushels per acre on volunteer wheat lands.

IRRIGATION AND DIVERSIFIED FARMING.

The area devoted to wheat in this region will doubtless be gradually curtailed by irrigation, which, although as yet undeveloped, is rapidly becoming an important factor in farming in this section of the country. As soon as an irrigation plant has been introduced into a district and begins active operations, it becomes possible to diversify crops by the planting of garden truck and small fruits which would not grow in many localities in this section without irrigation, and thus the land rapidly becomes too valuable for the cultivation of wheat. Irrigation, however, thus far has been practically confined to semiarid regions, and has not as yet had any appreciable effect on the wheat area of the region.

The chief factors in curtailing the area of wheat have been the introduction of fruit, particularly in the Sacramento Valley, and the attention recently given to dairying, which is rapidly gaining a strong hold in several sections of this region, notably in the Willamette Valley of Oregon, where wheat is being abandoned more rapidly than in any other portion of this region. The diversification of crops which naturally follows the introduction of irrigation will probably be extended in time even to the great wheat valleys of this region, where wheat has long been considered the only possible crop; but, as the more arid sections of the land will undoubtedly receive the first attention of the promotors of irrigation plants, it is not probable that the great wheat area of the Pacific coast will be materially lessened by crop diversification for many years to come.

WHEAT SECTIONS.

The great difference in agricultural methods employed both in preparing the soil and harvesting the crop in different sections of the Pacific coast wheat country makes it necessary to discuss each section separately, and for that purpose the region has been divided into four subsections, namely, California, Oregon, the Big Bend country of Washington, and the Palouse country in Idaho and Washington.

CALIFORNIA.

California extends over about $9\frac{1}{2}^\circ$ of latitude, or from 42° north to $32^\circ\ 32''$ north, with an entire State length of about 750 miles, equal to the distance from Boston to Savannah, and with an average width of about 200 miles, a total State area of about 150,000 square miles. Consequently, this State is a land of varied climates, ranging from temperate to subtropical, and from almost desert dryness to the humidity of the northern coast and higher mountains. On the coast proper, however, climatic conditions are far more equable than on the Atlantic seaboard, while from the coast eastward the changes are almost startling in their rapidity.

It is possible in a day's journey across the State to experience changes of climate from pleasant spring in San Francisco to hot summer in Sacramento, and before night to encounter a winter snowstorm in the Sierra Nevada Mountains.

To the peculiarities of climate due to the tempering influences of ocean currents and coast and mountain ranges the State owes much of its wonderful productiveness, and the variety and magnitude of its productions are largely due to these causes.

The agricultural development of California has been a surprise to all, and to none more so than to those who were in the State during the height of its mining period.

For many years the State was known solely for its gold output, and notwithstanding the fact that during that time many attempts were

made along agricultural lines, the wonderful productivity of the soil was not realized until the anticipation of a large profit from the home production of the necessaries of life, in a section where the cost of transportation from the distant East made even necessaries an almost extravagant expense, proved more alluring than the uncertainty of mining.

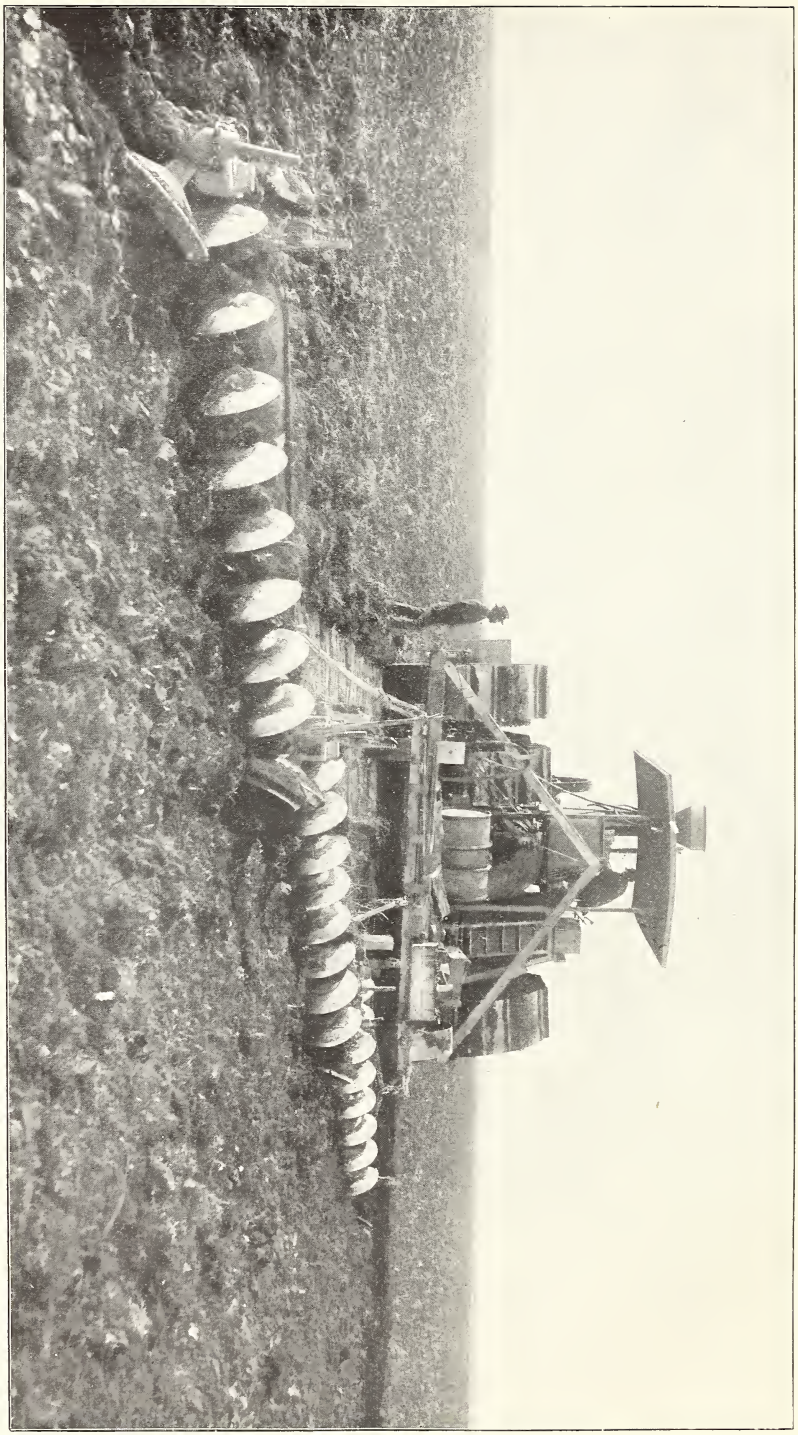
The pioneers found a virgin soil and a strange climate—so strange, indeed, that all past experiences went for nothing. The time and manner of putting in crops, care necessary for animals, and, in short, everything pertaining to farming operations, had to be learned anew.

It was soon found that if crops were planted at the proper time the soil responded with a generous yield, even if during a large part of the growing season no rain fell, and as a consequence a large number of persons began to look toward grain growing, cattle raising, and the production of wool as industries that would yield abundant returns.

The great wheat area of the State is contained in a central valley between the Sierra Nevada and Coast Range of mountains. This is the best agricultural region of the State, and contains about one-ninth of its entire area, being about 400 miles long and 50 to 70 miles in width. It is made up of two smaller valleys, taking their names from two rivers which flow through them. The northern portion, called the Sacramento Valley, is watered by the river of that name; while in the southern portion, the San Joaquin Valley, the San Joaquin River is the principal stream.

These two rivers unite about the middle of the great valley and empty into the Pacific Ocean through Suisun, San Pablo, and San Francisco bays, and form a break in the Coast Range of mountains which allows the influence of the sea winds access to the great central valley, and has an important effect on its climate. In this valley practically all the rains occur between November and May, the average annual precipitation being about 20 inches; and while 20 inches of rain is considered in most sections of the country rather a limited amount for the raising of crops, the fact that it all occurs in the six or seven months of plant growth makes it possible to produce fine crops with an even much smaller amount of rain than this. Rainfall is not evenly distributed over the entire valley, however; it is much more plentiful in the Sacramento Valley than in the San Joaquin. In fact, precipitation appears to decrease as we go south; but the great depth of the soil and the natural moisture arising from below makes grain culture possible and profitable far south of the 20-inch rain limit.

Plowing in this valley is quite generally done by gangs of from four to fourteen plows, with a six or eight mule team, and to an average depth of about 3 inches. Attached to the rear of the plow and drawn by the same team is a broadcast seed sower which sows the seed as fast as the ground is plowed. This is usually followed by a harrow,



REPLOWING WITH STEAM OUTFIT IN THE GREAT VALLEY OF CALIFORNIA.

[Photographed by Mr. P. E. Holt.]

attached also to the plow, which harrows in the seed as rapidly as it is sown. Thus, at one time are accomplished the three operations of plowing, sowing, and harrowing-in the seed by one man with his team of eight mules, at the rate of from 10 to 15 acres per day. No further attention is paid to the wheat field until it is time to cut the hay or harvest the crop of wheat.

On the larger farms plowing and replowing is frequently done by large gangs of plows or discs, drawn by a traction engine, and in this manner an enormous amount of work can be accomplished in a very short period of time. (See Pl. III.)

The period of growth for crops in California is during the winter season; and this is a busy time for the farmer, as he has to watch his opportunity for putting in his grain between rains. Much of the soil here is very similar to that of the low plain lands of the Middle West, and like them it dries up in summer; but the severe frosts which in the East assist the farmer in breaking up the ground are unknown here, and plowing has to be done in early spring or during the early autumn rains.

The wheat is ordinarily sown from September until the middle of January, November being the principal month. All wheat sown in the State is of the winter variety, and in cases where sowing is as late as January 1 it is entirely due to weather conditions which have made it impossible to sow earlier. The months in which the eastern crop ordinarily gets its principal growth are, in this region, the months of suspended animation. June, instead of being a season of bud and blossom, is here hot and dry, and the country at this time has the appearance of almost desolation.

On the other hand, however, we find a later fall and a long, mild winter, in which the young seed has ample chance to grow, and the plant is practically mature before the hot suns of June have an opportunity to do more than add the final touches to the ripening and drying of the grain. It is this peculiar hot drying effect of June and July which makes it possible to use the combined harvester and thrasher, which could not be used successfully on a grain not perfectly dry as well as thoroughly ripe.

Many varieties of wheat are sown in California, all of which are characteristically soft and white and abound in starchy matter, but, on account of the variation in the amount of moisture in different sections of the State, no one variety is planted exclusively over any considerable area. In southern California the Sonora and Defiance are the principal varieties, the latter being particularly valuable for its rust-resisting power, which is an important factor in this part of the State.

The grain of the Sonora wheat is a little harder than that of the Club wheats and is largely used for export, while the grain of the latter is more often used for home consumption.

In the country from Fresno to the northern end of the State the several varieties of Club wheats, notably the Australian, are principally used. The varieties most commonly planted in this locality are Golden Gate Club, Salt Lake Club, and Chili Club. Many other varieties are grown in the State, but they are largely local offshoots from the standard stock or importations from the East, and do not tend to materially affect the yield or grade of the grain. Numerous experiments, however, have been and are continually being made with the object of increasing the gluten content, and consequently improving the grade.

Another most interesting section of California largely devoted to wheat culture is that of the "Tule" lands, which are on islands in the river near Stockton. These islands were once vast flats covered with water and a growth of bulrushes, which the Spaniards called tule; hence the name of the land.

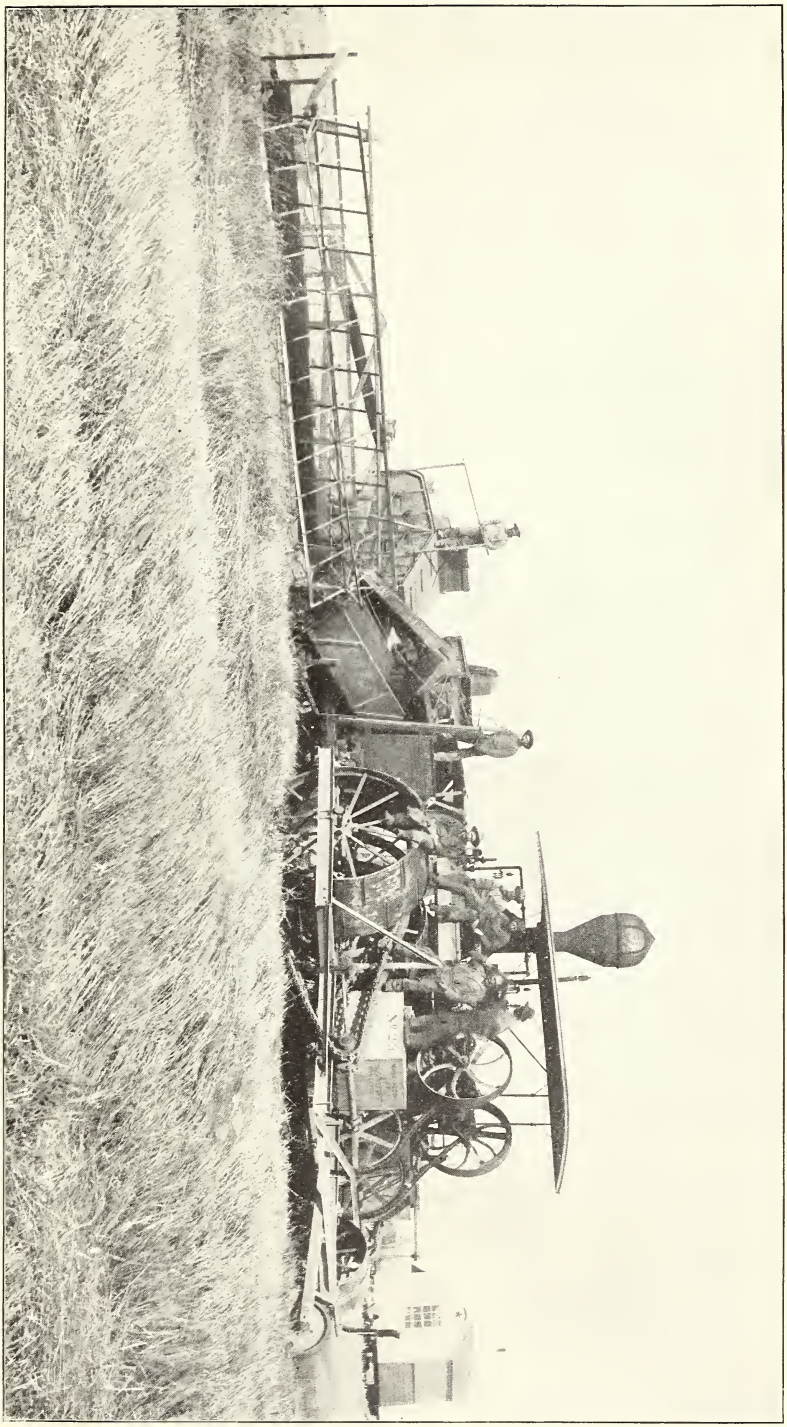
By means of pumps and drains and the throwing up of levees these lands have been reclaimed and are now among the most fertile of the State. Wheat on these lands yields ordinarily from 50 to 80 bushels per acre. The quality, however, is not so good as that in other sections, largely on account of lack of lime and potash in the soil, which, however, abounds in deposits of organic matter and is, consequently, remarkably fertile.

On account of the softness of the soil and the large cracks in the surface it is impossible to use horses on much of this land, and the greater part of the draft work is done by traction engines, and for this purpose the tires of the wheels are broadened by the addition of enormous drums, which aid in supporting the tremendous weight of the machines and in carrying them safely over the cracks and marshy soil.

Not the least picturesque and interesting scene in the great valley is the sight of the annual grain harvesting. Probably two-thirds of the entire wheat crop of the State is harvested with the combined harvester-thrasher. The great level wheat fields of the central valley, and even the slopes of the foothills, favor the use of the most ponderous machinery, and a sight of a modern harvesting outfit at work in a California wheat field is to the Eastern man both novel and interesting.

The ponderous harvester sweeps through miles upon miles of ripened grain, cutting swaths from 16 to 42 feet in width, harvesting, cleaning, thrashing, and leaving behind a long trail of sacked grain, ready to be hauled to the warehouse, railroad, or mill.

This combined harvester and thrasher, which is used in harvesting very generally throughout the State, is usually drawn by 24 to 40 horses, harvests and sacks from 25 to 45 acres of wheat per day, and requires four men to operate it. By its use grain is thrashed directly from the field and left piled in sacks containing about 2½ bushels each.



HARVESTING WHEAT IN CALIFORNIA WITH STEAM OUTFIT.

[Photographed by Mr. P. E. Holt.]

REAR VIEW OF STEAM HARVESTING OUTFIT, SHOWING METHOD OF DUMPING SACKED GRAIN.

[Photographed by Mr. P. E. Holt.]

These sacks are stacked in the field, sometimes for weeks, without fear of material damage from the weather. The standard horse machine commonly used cuts a swath from 16 to 20 feet wide, and the combined steam outfit of traction engine and harvester has a cutting bar from 24 to 42 feet long, harvests from 60 to 125 acres per day, and requires eight men to operate it.

Although the grain lands of the Sacramento and San Joaquin valleys extend over about 10° of latitude, which would make a great difference in the time of sowing and harvesting a crop in the East, the following calendar may properly be said to show the wheat-farming operations of the different months of the year in all of the great valley:

October.—Farming year begins and nearly all leases and contracts terminate at that time. The rainy season also begins at this time and plowing for winter wheat is started.

November.—The rain continues; also plowing; wheat seeding is in full blast. This is the heaviest seeding month of the year.

December.—Continued rain, and plowing and seeding continue.

January.—Beginning of spring; more rain; plowing and seeding practically finished.

February, March, and April.—Growing season; continued rain.

May.—Dry season begins; hay crop is harvested.

June.—Summer; wheat harvesting begins.

July.—All wheat ready for harvesting; pastures turning brown.

August.—Wheat harvesting ended.

September.—Wheat marketed and implements overhauled preparatory to a new season.

OREGON.

The principal wheat district of Oregon is situated in the country west of the Cascade Mountains and eastward from Wasco County to Union, covering six of the northern counties of the State. In the Willamette Valley, and in fact in all of the territory of Oregon west of the Cascades, conditions are not materially different from those in California. The summer season, however, is very much cooler than that of the latter State, and harvesting is consequently correspondingly later.

Much of the best agricultural land in the State is located in the Willamette Valley, which has long been noted for its great wheat crops. This valley is about 135 miles long, and of an average width of about 60 miles. It lies between the Cascade Mountains and the Coast range, and is drained by the Willamette River. The surface of the soil is generally undulating, but it also contains numerous large areas, which are almost perfectly flat. A greater diversification of crops is practiced in this section than in any other portion of the State.

Dairying has obtained a very strong foothold, and is contributing largely toward the prosperity of the country. Many farmers in this section are entirely abandoning wheat, or planting only a small area in that cereal, and giving increased attention to raising milch cows and forage crops for their feed.

Notwithstanding the diversification of interests, however, wheat is still the staple crop of the valley, and will undoubtedly be so for many years to come. The principal wheats sown in this region are the several varieties of Club wheats, Red Chaff and Foise.

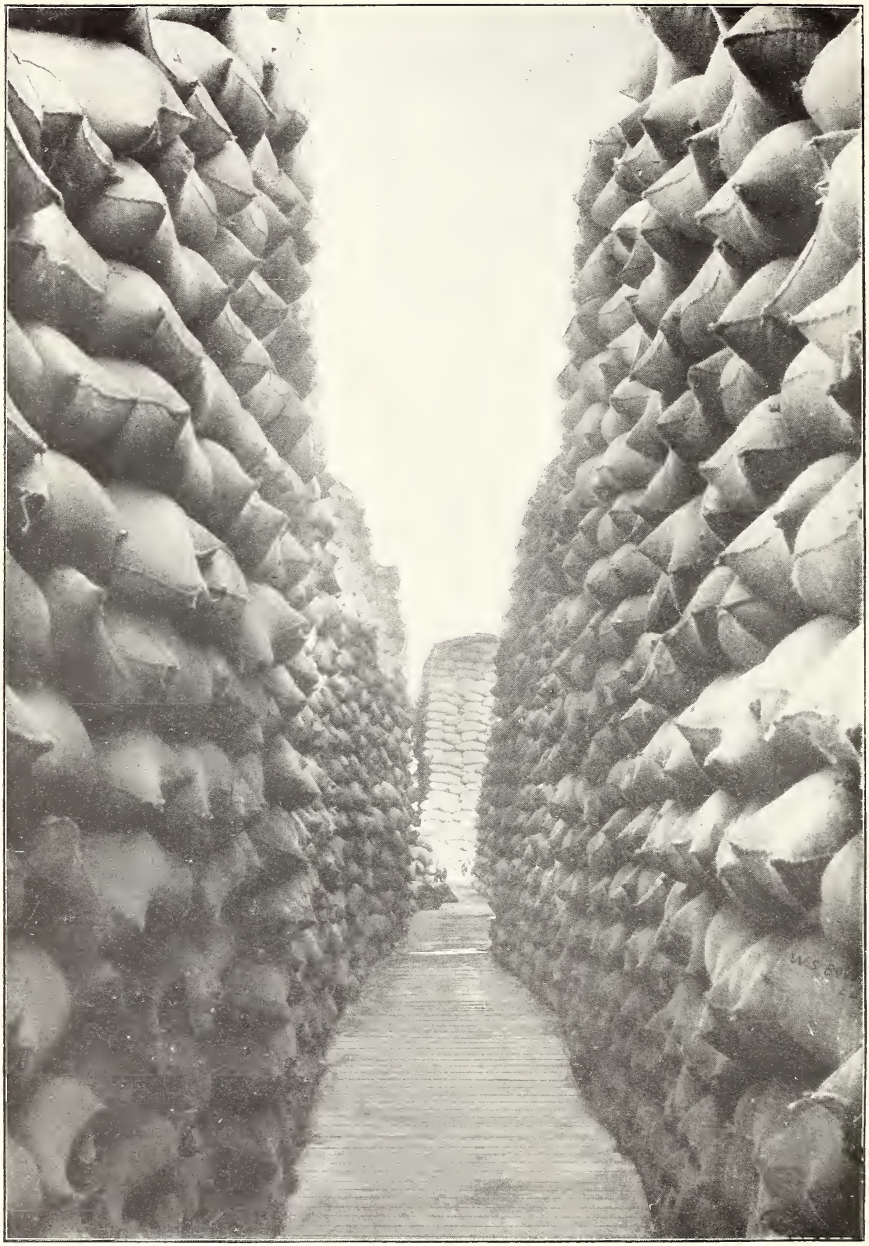
The method of preparing the land for the crop differs from that of California and is more after the Eastern plan, or that of the Middle West. Plowing is generally deeper, and is usually done with plows set in gangs of two. The seed is all drilled in, instead of being broadcasted, as is the case farther south. The harvesting is principally done with a self-binder, although headers are used to a certain extent in some sections.

The combined harvesters are not used in this particular section of the State, as the character of the soil and the smaller size of the farms make it more profitable to use smaller machinery. The dampness of the atmosphere has also an important effect in determining the kind of machinery used, as it is impossible to use a combined harvester on grain which is not thoroughly ripened and perfectly dry at the time of harvesting.

In the northern counties, where much of the wheat of the State is grown, the soil is a rich sandy loam, blended with a trace of volcanic ash, easily cultivated and highly productive. Farms are large, often running into thousands of acres, and work in this section is done on fully as large a scale as in California.

Wasco County, the most western of this group, extends eastward about 66 miles from the Grand Canyon of the Columbia River. The soil yields well, holds water admirably, and with proper farming methods is practically inexhaustible. Continuous cropping has gone on for many years, wheat being raised each season on the same soil, and crop failure is practically unknown. The ability of the soil to absorb and retain moisture has been amply demonstrated by the raising of heavy crops without a drop of rain from seedtime to harvest.

On account of the low price of wheat, farmers of this section have found it profitable during the last few years to feed much of their wheat in the form of hay to stock and market the stock. This plan, however, while it holds good when the price of wheat is not above 50 cents a bushel on the farm, is not followed every year, for the reason that when wheat is above that price it is more profitable to sell the grain than to cut the wheat for hay. Farmers state that wheat can be grown in all this region for a trifling expense, some even claiming that it can be raised and sacked for 20 cents per bushel.



BETWEEN THE WALLS OF 100,000 SACKS OF WHEAT AT MISSION, OREGON.

[Size of warehouse 56 by 310 feet; amount of wheat in sacks 250,000 bushels. Photograph furnished by Mr. Leo Peterson.]

The largest compact wheat area in the State is probably to be found in Sherman County, and the average yield in this county for the past six or eight years has been over 25 bushels per acre. The quality of the wheat grown in this county is also of the best, and not surpassed by that raised in any other portion of the State, and the flour made in this region is in great demand both locally and for export.

Gilliam and Morrow counties are also large producers of wheat, although in these counties much fertile land, easy of cultivation, is still awaiting the pleasure of the settler.

Umatilla County is especially noted for its great production of wheat, the average yield being about 30 bushels per acre, and with more careful methods of cultivation it will be possible to largely increase this average. The farms here are also quite large, as is the case through all the northern section of Oregon, and all work is done on a large scale. Wheat hay is cultivated generally on the hilly land, and often pays the small farmer much better than the grain.

Irrigation is on the increase, not only in Umatilla County, but through all of this region, and while it has not as yet had any appreciable effect on the area of wheat, it is undoubtedly having a tendency to make the land too valuable for the planting of cereals; and as irrigation increases, its effects on the wheat area of the State will probably be more marked.

Union County, while mountainous, has many fertile valleys, and is famous as a wheat-producing section. The most important of these valleys is the Grand Ronde. It is about 30 miles long and 18 miles wide, and is well watered by a river of the same name. Climatic conditions are especially favorable to wheat cultivation, and irrigation is unnecessary. The soil is apparently inexhaustible, as each year appears to add vigor to it. A yield of 60 bushels per acre in this valley is not uncommon.

The general characteristics of all the wheat territory of Oregon east of the Cascade Mountains are very similar to those of the famous Palouse Valley, a description of which is given below.

The proportions of spring and winter wheat planted in the State are about equal. There is no particular locality, however, for either variety, the principal factor influencing their planting being the state of the weather at seeding time.

Although table 5 shows about an equal increase in the areas of winter and spring wheat, the present tendency is in the direction of an increase of the area of winter wheat at the expense of the spring variety.

WASHINGTON.

Probably three-fourths of the entire area of the State of Washington is devoted to the cultivation of wheat. The western section of the State has the same general characteristics of soil and climate as the Willamette Valley of Oregon. The remainder of the State may be

divided into three sections—the Big Bend country, which embraces that portion of the State immediately south of the big bend of the Columbia River, and is largely confined to Douglas, Lincoln, and Adams counties; the Walla Walla district, which is composed of Walla Walla and Columbia counties, and the Palouse country, so named from the tribe of Indians that inhabited that region at an early time. The general characteristics of all this country are somewhat similar, and a description of the great Palouse Valley will apply very well to the Big Bend and Walla Walla country.

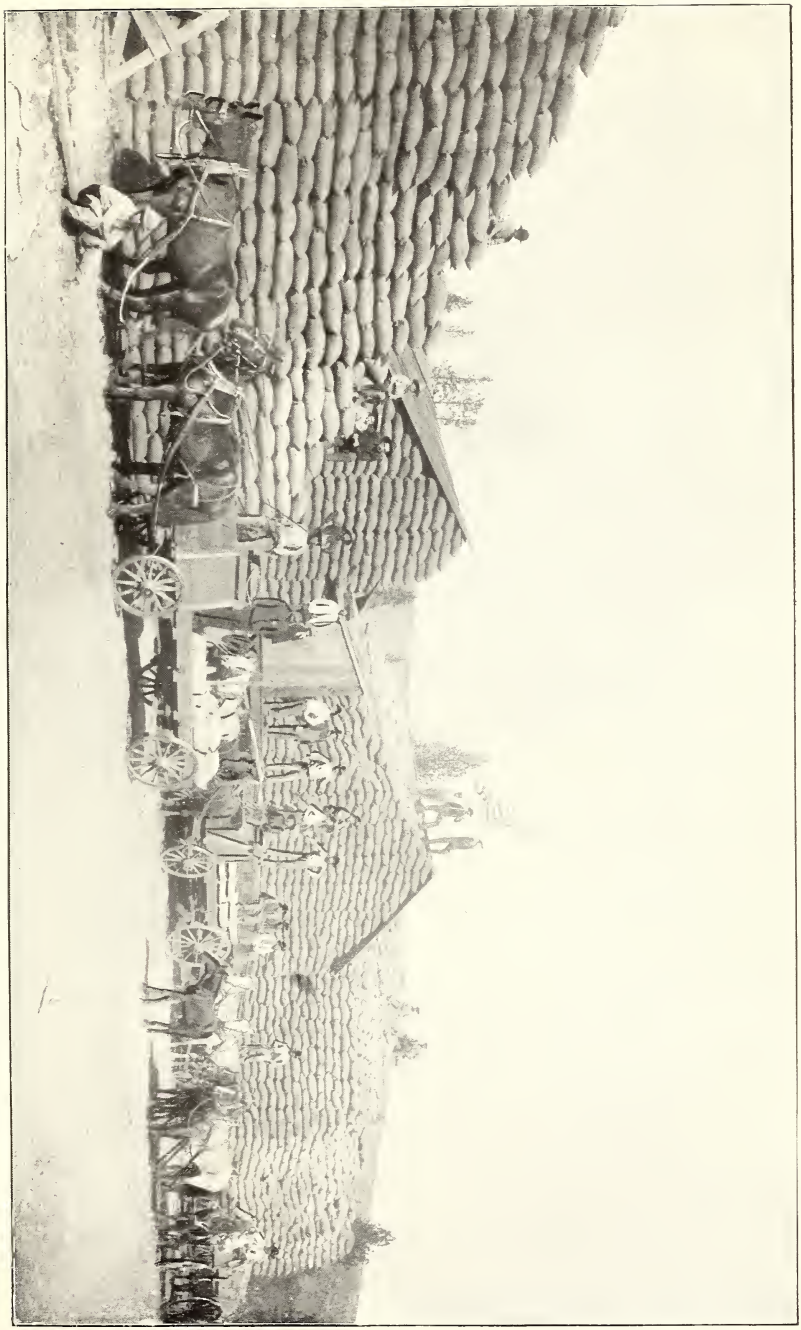
The Palouse Valley begins about 15 miles below Spokane and extends southward about 100 miles, has an average width of about 40 miles, and is watered by the Palouse River. The Palouse country was originally considered to include a rather limited area, comprising Whitman and portions of Adams and Franklin counties in Washington and Latah County in Idaho.

More recently, however, as it began to be noticed that similar climatic conditions prevailed in other near-by sections of the country, the term has come to be applied to nearly all of Garfield and Walla Walla counties, and also to the northern portion of Umatilla County, Oregon, as well as Nez Perces County, Idaho.

There are two peculiar features which most distinguish this region from that of the Pacific coast proper, viz, the dryness of the climate and the very finely divided condition of the soil. The particles are often so very fine that the soil is practically mere dust. At the same time the nature of its component parts is such that a very little moisture is sufficient to make it sticky and difficult to manage.

The capacity of the soil to absorb and retain moisture is another remarkable feature of this region. It is the general opinion that a rainfall of 12 inches is quite sufficient for the raising of a crop of wheat in this district, while in the States of the plains 18 to 20 inches is not considered sufficient for successful wheat growing. The principal varieties of wheat grown in this section, except Palouse Blue Stem, are of the Club Wheat group, and they are usually soft-grained and starchy and generally white; very similar to those of the coast region proper, but of a little better quality. Palouse Blue Stem, Palouse Red Chaff, and Little Club are the principal varieties. Martin Amber is also sown to a considerable extent.

The first three varieties are grown in sections of the country which are definitely marked. In the western belt Blue Stem is grown, Red Chaff in the middle belt, which runs through the heart of the Palouse region, and Little Club in the eastern belt, which reaches to the foothills of the mountains. The most damaging agent that the farmer of the Palouse country has to deal with is the annually recurring drought, which usually occurs about two weeks before harvest time, and is particularly severe in the western and southern portions of the territory.



SACKED WHEAT AWAITING SHIPMENT IN THE PALOUSE COUNTRY DURING THE WHEAT BLOCKADE OF 1897.

[Photograph furnished by the "Spokesman Review."]

From this cause the wheat is often badly shriveled, and both yield and quality are much affected. This is slightly offset, however, by the larger percentage of gluten in the shriveled wheat, which makes it available in the manufacture of macaroni. In order to escape the effects of the severe drought, early maturing varieties of seed are exceedingly desirable, and much experimental work has been done with this end in view. If a variety maturing fifteen days earlier could be secured, it would doubtless add several million dollars a year to the wealth of this region.

All of the wheat country of Washington is particularly adapted to the raising of this cereal. The soil and climate are of the best, and crop failures are practically unknown. Farms are more modest in size than is the case in California and Oregon, but no great progress has been made toward the diversification of crops.

The preparation of the soil is but little different from that of Oregon. The farmer plows the ground to a depth of from 2 to 4 inches, generally using a gang plow of two plows drawn by four horses. Plowing here is rather more shallow than is the case in Oregon, owing to the fact that deep plowing brings up the volcanic ash and makes the field little more than a dust heap. Seed is usually drilled in, although in some localities the old practice of broadcasting by hand still survives.

Fall seeding lasts from the early rains of September until the middle or the end of November, and October is the principal seeding month. In the spring the seeding season varies with the condition of the soil, which is at all times and in all sections of the State most peculiar. From 60 to 70 pounds of seed wheat are ordinarily sown to the acre. Grain ripens more rapidly in the Walla Walla district than in any other portion of the State. Harvesting begins in some sections about the middle of June and lasts until late in August. Upon the larger farms on the flat valley lands the combined harvester is utilized, but in nearly all of the Palouse country self-binders are still used, principally on account of the early rains, which render the grain too moist to be harvested with the combined machine.

Summer fallowing is practiced on nearly all of the wheat land in the State, particularly in the Palouse and Big Bend country, about half the land being summer-fallowed each year, so that the average production is about one crop in two years.

Following this method of cultivation, the soil of these regions appears to be practically inexhaustible, as the same land has grown wheat continuously for years without fertilization, and crops are as large now as they were a quarter of a century ago, if not larger.

During the harvest months the weather is generally dry and settled and rain is very rare. Thrashed grain may lie upon the ground in sacks for a long time without damage from the elements. This enables

the farmer to gather the sacked grain at his convenience and store it or haul it to the railroad station.

Many of the farmers still adhere to the custom of burning the straw in the field, but lately it has been possible to sell straw at a small price and to thereby avoid adding ashes to a soil which has already an abundance of the ashy element, as is the case in this particular part of the Pacific coast region.

Careful farmers who have given particular attention to wheat culture, and kept records of its cost, are generally of the opinion that wheat which yields 25 bushels per acre, or more, can be raised and put in the sack for not more than 26 cents per bushel. Farmers who operate on a small scale find the cost a little larger on account of the lack of labor-saving machinery, which naturally reduces the cost on the large tracts. As is the case in Oregon, the areas of winter and spring wheat in the State are about equally divided.

A considerable area of the wheat of this State is cut for hay each year. The amount so used is largely dependent on the relative price of hay and wheat, and also on the condition of the grain at the time of cutting. In a weedy field, particularly where the weed is wild oats, it is more profitable to cut the wheat for hay than to allow it to ripen.

Cutting for hay when green not only gives the farmer the hay to feed his stock or to sell, but prevents the maturing of the weeds, and has the effect of cleaning up the field for the next year's crop. Very little so-called volunteer wheat is grown in this State, but occasionally summer-fallowed land will "volunteer," and that is either pastured or cut green for hay.

Irrigation has not thus far had any appreciable effect on the wheat area of the State, having been largely confined to sections where wheat was not raised, or, if raised at all, was not the staple crop. Fruit cultivation, however, has diminished the wheat area in certain sections, particularly in the country immediately at the head of the Great Palouse Valley and tributary to the city of Spokane.

In the central and northern portions of the State fall sowing is the rule. In the northern and eastern portions a large proportion of the area is seeded in the spring. Winter wheat, however, is gradually crowding out the spring variety, and new, hard wheats are constantly being introduced with that end in view. The winter wheat is principally all drilled in, while the spring wheat is very generally broadcasted.

Table 5 shows the acreage and production of winter and spring wheat in Oregon and Washington from 1894 to 1900.

TABLE 5.—*Acreage and production of winter and spring wheat in Oregon and Washington, 1894 to 1900.*

Year.	Oregon.				Washington.			
	Winter wheat.		Spring wheat.		Winter wheat.		Spring wheat.	
	Acres.	*Bushels.*	*Acres.*	*Bushels.*	*Acres.*	*Bushels.*	*Acres.*	*Bushels.*
1894	262,501	4,646,268	327,390	5,794,803	252,951	4,198,987	295,749	4,909,433
1895	249,376	4,987,520	343,760	6,875,200	227,656	3,528,668	236,599	3,667,284
1896	269,326	4,578,542	333,447	5,668,599	225,379	4,056,822	238,965	4,301,370
1897	419,702	7,134,934	648,241	11,020,097	417,908	9,820,838	458,469	10,303,810
1898	512,036	10,496,738	693,245	14,211,522	442,982	10,720,165	526,152	12,732,878
1899	491,555	9,437,856	651,650	12,511,680	398,684	9,050,127	557,721	12,660,267
1900	548,185	7,564,953	625,584	8,633,059	504,645	11,859,158	563,298	13,237,503

IDAHO.

The cultivation of wheat in Idaho is practically confined to the northwestern end of the State, the area of greatest average production being contained in Latah and Nez Perces counties, which form the eastern end of the Great Palouse Valley. Conditions here are practically the same as in the remainder of the valley. Rich soil and favorable climate combine to make this one of the finest wheat-producing sections of the region.

Idaho is largely an export State, as only about 50 per cent of the wheat crop is consumed at home. The remainder is sent to Portland or to one of the Puget Sound ports for shipment. The same methods of harvesting are in vogue as in the remainder of the Palouse Valley, the principal amount of the wheat being cut with self-binders. The wheat sown in this State is practically all of the spring variety.

ACREAGE, PRODUCTION, AND VALUE.

Although the tables following show in many instances figures for years as early as 1868, it has been thought advisable, on account of the rapid development of the country, to base all averages on the crops of the past ten years.

There are on the average 4,343,801 acres of wheat harvested in the Pacific coast region each year. An average for the past ten years shows that this section of the country will ordinarily yield about 15 bushels per acre and produce a total annual crop of 65,017,582 bushels, valued on the farm at $41,649,812.

California is the State of largest acreage and production of the group, the average for the past ten years being 2,705,621 acres, producing 33,308,218 bushels of wheat, with a total value of $23,183,296. The largest acreage planted in that State during its entire history was in 1884, when a little more than three and a fourth million acres were harvested for grain. The smallest acreage harvested in the State since 1870 was harvested in 1898, conditions during the growing season of that year being so unfavorable that a large proportion of the crop

sown to wheat was totally abandoned or cut for hay, which resulted in the harvesting of but 1,343,341 acres in the entire State.

The production has fluctuated somewhat, the yield depending largely on the acreage devoted to the crop and weather conditions during the period of growth. The year of greatest production was 1896, when the total yield was 45,097,195 bushels and the average yield per acre was 14.6 bushels, the largest average yield during the past ten years, and this doubtless accounts for the increased acreage sown the following year.

The production has varied all the way from this figure to 12,224,403 bushels in 1898, in which year, in addition to harvesting a very small acreage, the average yield was the lowest ever recorded in the State, being but 9.1 bushels per acre, against a ten-year average of 12.3 bushels. This average has been exceeded in six years out of the ten, the highest average, naturally, being in 1896, the year of largest production. Values have fluctuated according to supply and demand from $43,249,700 in 1878 to $8,801,570 in 1898. The average farm price per bushel decreased from $1.03 in 1868 to 53 cents in 1893, increasing from that to 83 cents in 1896 and 1897, with a final decrease to 58 cents in 1900.

Oregon has shown a steadily increasing wheat acreage, interrupted only occasionally, from 92,105 acres in 1869 to 1,173,769 acres in 1900, and the average for the last ten years was 830,753 acres. The average yield per acre during the ten-year period has been 17.7 bushels, the years of largest average yield during that time being 1895, with 20, and 1898, with 20.5 bushels, resulting in a total yield of 24,708,260 bushels on 1,205,281 acres harvested. The heavy yield in 1895, however, produced only a total of 11,862,720 bushels, for the reason that but 593,136 acres were harvested.

The average farm price in Oregon has fluctuated from 85 cents per bushel in 1869 to $1.11 in 1877, and a decrease to 43 cents in 1894, from which figure it has, with numerous fluctuations, finally reached 55 cents in 1900.

The total value of the wheat product of this State has averaged during the past ten years $8,914,053, the great total value in 1891 on a very small acreage being accounted for by the fact that there was a very large yield per acre in that year and also a very high farm price.

Washington is the next State in order of acreage, where about 703,560 acres of wheat are harvested annually. Until 1882 returns for Washington and Idaho were included with those for the Territories existing at that time, and no statistics for these States individually are available for earlier years.

The wheat acreage in Washington has fluctuated to a considerable extent since 1882, in which year there were 148,000 acres planted,

from which there was a steady increase to 486,791 acres in 1888 and a still further increase to 698,040 acres in 1891, followed by a gradual decrease to 464,255 acres in 1895, from which there was as steady an increase to 1,067,943 acres in 1900.

Yields have varied considerably during the last decade, the average being 20.8 bushels per acre. Improved methods of farming in late years have materially raised the average yield per acre in this State, and each of the years from 1887 to 1900 has shown a yield considerably above the average for the decade. The year 1900 was the year of largest total production of the State, 25,096,661 bushels being produced. The year of smallest production was 1882, when but 2,440,000 bushels were produced. This year, however, was also the year of smallest acreage.

Farm prices show a steady decrease from 83 cents in 1882 to 39 cents in 1894, after which there were numerous fluctuations, the price going as high as 74 cents in 1896 and as low as 51 cents in 1899 and 1900. The total annual value of the wheat crop of Washington has averaged $8,203,739 during the past ten years. Every one of the four years ending with 1900 has been considerably above this average, which, however, is considerably larger than the value of the crop of any year preceding except 1891, when the total value was $9,161,775.

Idaho, the smallest State in the group, has harvested on the average 103,868 acres in each of the ten years ending with 1900. The acreage shows a steady increase from 40,625 in 1882 to 90,531 in 1891, from which figure it decreased gradually to 68,646 in 1895, followed by a steady increase to 149,261 acres in 1900. The total annual yield has followed very closely the variations in the area except in one or two years where the average yield has been somewhat larger or smaller than the ordinary. The average annual total yield for the State during the past ten years has been 2,366,095 bushels, and the average yield per acre 22.8 bushels. This average per acre has been exceeded in but three years during the decade—1896, 1898, and 1899—all the other years showing a considerable decrease except in one or two instances, where the yields are very near the average figure.

The total value of wheat produced in this State during the ten years ending with 1900 averaged $1,348,724, the year of greatest total value being 1898, when the crop was valued at $2,140,421; this year, however, was the year of largest yield per acre during the history of the State, about 31 bushels being produced on each acre harvested.

The average farm price, however, during that year was not particularly high, being but 51 cents per bushel, against $1.40 in 1882 and 84 cents in 1891. The lowest farm prices during the entire period were in 1894 and 1900, in each of which years the average was but 46 cents.

Table 6 shows the acreage, production, value, and average yield per acre of wheat in the Pacific coast States for the period covered by investigations of the Department of Agriculture.

TABLE 6.—*Acreage, production, value, and average yield of wheat per acre in the Pacific coast States, 1868 to 1900.*

Year.	California.				Oregon.			
	Acres.	Bushels.	Value.	Average bushels per acre.	Acres.	Bushels.	Value.	Average bushels per acre.
1868	1,050,000	21,000,000	$21,630,000	20.0	.....	.....	.....	.....
1869	1,098,901	20,000,000	18,600,000	18.2	92,105	1,750,000	$1,487,500	19.0
1870	746,052	14,175,000	15,592,500	19.0	116,410	2,270,000	2,156,500	19.5
1871	1,523,363	16,757,000	23,627,370	11.0	119,375	2,292,000	2,383,680	19.2
1872	2,098,360	25,600,000	28,416,000	12.2	132,197	2,406,000	1,780,440	18.2
1873	1,592,889	21,504,000	28,385,280	13.5	164,579	3,127,000	2,814,300	19.0
1874	2,150,000	28,380,000	28,096,200	13.2	250,000	4,875,000	3,315,000	19.5
1875	2,163,636	23,800,000	28,084,000	11.0	255,681	4,500,000	3,915,000	17.6
1876	2,307,692	30,000,000	34,200,000	13.0	275,000	4,675,000	3,272,500	17.0
1877	2,315,789	22,000,000	28,600,000	9.5	343,750	6,875,000	7,631,250	20.0
1878	2,470,000	41,990,000	43,249,700	17.0	365,000	7,665,000	7,051,800	21.0
1879	2,500,000	35,000,000	43,050,000	14.0	511,800	8,188,800	8,025,024	16.0
1880	2,117,350	33,877,600	32,522,496	16.0	690,260	11,734,420	9,152,848	17.0
1881	2,367,200	31,406,000	32,348,180	13.3	738,600	12,673,000	11,152,240	17.2
1882	2,767,000	36,046,600	32,441,940	13.0	723,000	12,039,300	10,233,405	17.8
1883	2,794,000	36,322,000	36,322,000	13.0	795,300	13,122,400	11,810,160	16.5
1884	3,360,000	44,320,000	31,910,400	13.2	858,924	15,462,000	7,421,760	18.0
1885	2,822,400	26,592,000	17,816,640	9.4	876,102	13,916,000	9,602,040	15.9
1886	3,104,640	36,165,000	26,400,450	11.6	884,640	11,133,000	7,570,440	12.6
1887	2,766,235	30,429,000	22,517,460	11.0	920,026	16,100,000	10,948,000	17.5
1888	2,351,300	28,451,000	24,183,350	12.1	892,425	14,548,000	11,347,440	16.3
1889	3,291,820	43,781,000	30,646,844	13.3	845,000	13,689,000	9,582,300	16.2
1890	2,426,730	29,121,000	22,131,778	12.0	887,250	12,865,000	9,648,844	14.5
1891	2,815,007	36,595,000	34,765,336	13.0	692,055	13,149,000	11,571,160	19.0
1892	3,012,057	39,157,000	26,626,584	13.0	622,850	9,779,000	5,258,397	15.7
1893	2,620,490	34,852,517	18,471,834	13.3	616,622	10,790,885	5,934,987	17.5
1894	2,688,204	30,376,705	17,314,722	11.3	589,891	10,441,071	4,489,661	17.7
1895	3,084,446	40,097,798	24,058,679	13.0	593,136	11,862,720	5,575,478	20.0
1896	3,088,849	45,097,195	37,430,672	14.6	602,773	10,247,141	7,377,942	17.0
1897	3,239,402	32,394,020	26,887,037	10.0	1,067,943	18,155,031	13,071,622	17.0
1898	1,343,341	12,224,403	8,801,570	9.1	1,205,281	24,708,260	15,319,121	20.5
1899	2,393,185	33,743,909	20,921,223	14.1	1,143,205	21,949,536	11,633,254	19.2
1900	2,771,226	28,543,628	16,555,304	10.3	1,173,769	16,198,012	8,908,907	13.8

Year.	Washington.			Average bushels per acre.	Idaho.			Average bushels per acre.
	Acres.	Bushels.	Value.		Acres.	Bushels.	Value.	
1882	148,000	2,440,000	$2,025,200	16.5	40,625	650,000	$910,000	16.0
1883	170,200	3,182,700	2,705,295	18.7	44,687	682,500	614,250	15.3
1884	326,366	4,118,000	2,470,800	12.6	59,400	1,120,000	806,400	18.9
1885	424,276	7,412,000	5,336,640	17.5	62,370	1,154,000	865,500	18.5
1886	445,490	7,560,000	5,065,200	17.0	65,489	1,039,000	748,080	15.9
1887	463,610	8,345,000	5,591,150	18.0	64,015	1,120,000	862,400	17.5
1888	486,791	9,006,000	7,024,680	18.5	76,818	1,252,000	1,089,240	16.3
1889	415,500	6,856,000	4,799,025	16.5	81,427	1,449,000	1,116,039	17.8
1890	436,275	8,071,000	6,134,027	18.5	83,056	1,370,000	1,068,931	16.5
1891	698,040	12,216,000	9,161,775	17.5	90,531	1,811,000	1,520,921	20.0
1892	523,530	9,005,000	5,222,735	17.2	76,951	1,693,000	1,015,753	22.0
1893	486,883	9,883,725	4,744,188	20.3	78,490	1,514,857	908,914	19.3
1894	548,700	9,108,420	3,552,284	16.6	76,057	1,566,775	720,717	20.6
1895	464,255	7,195,952	2,950,340	15.5	68,646	1,221,899	574,293	17.8
1896	464,344	8,358,192	6,185,062	18.0	98,127	2,404,112	1,562,673	24.5
1897	856,368	20,124,648	13,684,761	23.5	123,076	2,707,672	1,895,370	22.0
1898	969,134	23,453,043	12,664,643	24.2	135,384	4,196,904	2,140,421	31.0
1899	956,405	21,710,394	11,072,301	22.7	142,153	3,440,103	1,720,052	24.2
1900	1,067,943	25,096,661	12,799,297	23.5	149,261	3,104,629	1,428,129	20.8

TABLE 6.—*Acreage, production, value, and average yield of wheat per acre in the Pacific coast States, 1868 to 1900*—Continued.

Year.	Total.			Average bushels per acre.
	Acres.	Bushels.	Value.	
1882	3,678,625	51,175,900	$45,610,545	13.9
1883	3,804,187	53,309,600	51,451,705	14.0
1884	4,604,690	65,020,000	42,609,360	14.1
1885	4,185,148	49,074,000	33,620,820	11.7
1886	4,500,259	55,897,000	39,784,170	12.4
1887	4,213,886	55,994,000	39,919,010	13.3
1888	3,807,334	53,257,000	43,644,710	14.0
1889	4,633,747	65,775,000	46,144,208	14.2
1890	3,833,311	51,427,000	38,983,580	13.4
1891	4,295,633	63,771,000	57,019,192	14.8
1892	4,235,388	59,634,000	38,123,469	14.1
1893	3,802,485	57,041,984	30,059,923	15.0
1894	3,902,852	51,492,971	26,077,384	13.2
1895	4,210,483	60,378,369	33,158,790	14.3
1896	4,254,093	66,106,640	52,556,349	15.5
1897	5,286,789	73,381,371	55,538,790	13.9
1898	3,653,140	64,582,610	38,925,755	17.7
1899	4,634,948	80,843,942	45,346,830	17.4
1900	5,162,199	72,942,930	39,691,637	14.1

WHEAT IN FARMERS' HANDS.

The amount of wheat remaining in farmers' hands has been the subject of statistical investigation by the Department of Agriculture on March 1 of each year, beginning with 1893, and such investigations have established the fact that the farmer of the Pacific coast usually retains about 23.1 per cent of his wheat crop until after the 1st of March. These reserve stocks vary considerably, and are apt to be largely influenced by the price of wheat and the export demand.

In a year when the price is high, or exports unusually large, the farmer naturally markets his crop much earlier than he would in a year of poor demand and low price. Farm stocks in California ranged from 36 per cent of the preceding year's crop in 1890 to 9 per cent in 1895 and 1897, and of the crop of 1900, 4,566,980 bushels, or 16 per cent, was still in the hands of the farmer on March 1, 1901.

In Oregon the percentage ranged from 35 in 1891 and 1900 to 15 in 1897, and on March 1 of the present year 20 per cent of the crop of 1900 was still in the farmers' hands, a total reserve of 3,239,602 bushels.

Washington shows a far greater range than either California or Oregon, stocks on hand varying from 47 per cent in 1899 to 11 per cent in 1897, with 5,521,265 bushels, or 22 per cent, remaining on hand on March 1 of the present year.

Idaho shows the largest percentage of wheat in farmers' hands on March 1 of the present year of any of the Pacific coast States, 37 per cent being still in reserve, a total of 1,148,713 bushels. Fluctuations have ranged from 40 per cent in 1892 and 1899 to 14 per cent in 1895.

Table 7 shows the stocks of wheat in farmers' hands on March 1 of each year from 1883 to 1901.

TABLE 7.—*Wheat in farmers' hands in the Pacific coast States on March 1, 1883 to 1901.*

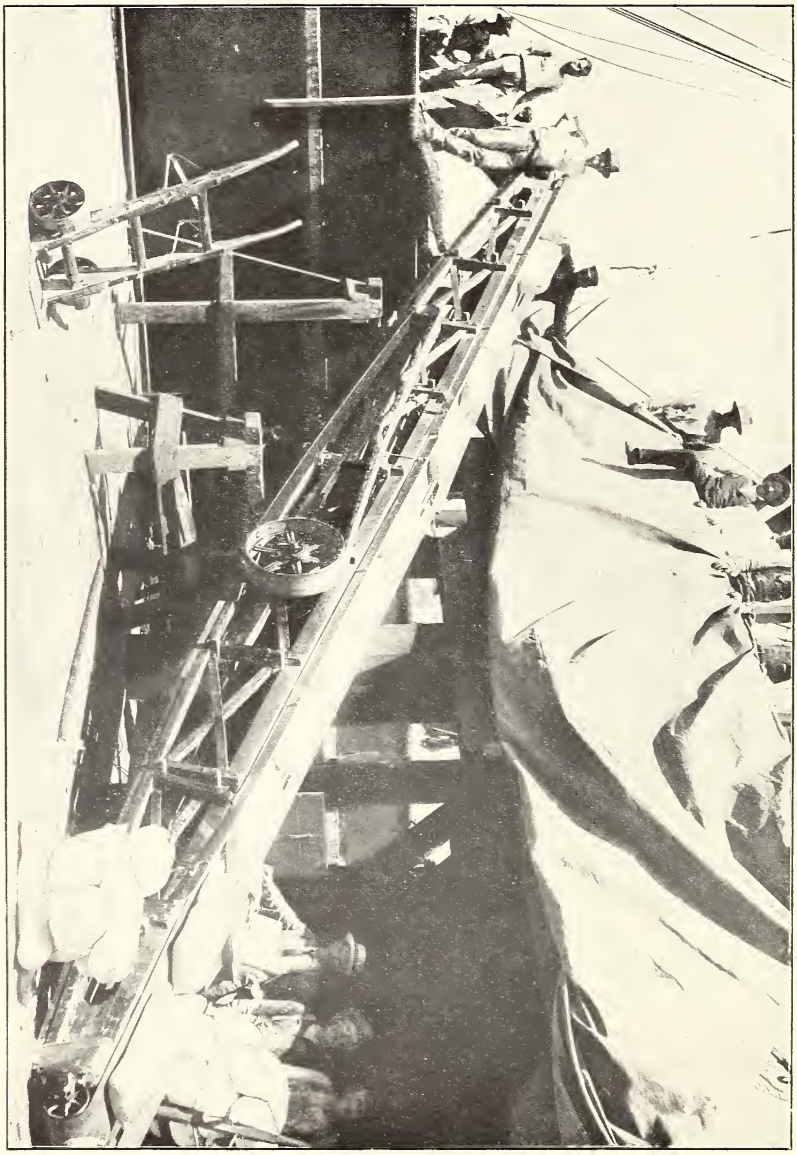
Year.	California.		Oregon.		Washington.	
	Percentage of previous year's crop.	Bushels.	Percentage of previous year's crop.	Bushels.	Percentage of previous year's crop.	Bushels.
1883	24	8,291,184	21	2,528,253	25	610,000
1884	24	8,717,280	17	2,230,808	23	732,021
1885	36	15,955,200	30	4,638,600	26	1,070,680
1886	26	6,913,920	32	4,453,120	35	2,594,200
1887	20	7,233,000	24	2,671,920	27	2,041,200
1888	28	8,520,120	30	4,830,000	31	2,586,950
1889	27	7,681,770	32	4,655,360	31	2,791,860
1890	36	15,761,160	31	4,243,590	20	1,371,200
1891	30	8,736,300	35	4,502,750	35	2,824,850
1892	21	7,684,950	18	2,366,820	16	1,954,560
1893	23	9,006,110	22	2,151,380	20	1,801,000
1894	28	9,758,560	33	3,561,030	40	3,953,600
1895	9	2,733,930	17	1,774,970	18	1,639,440
1896	13	5,212,740	27	3,203,010	22	1,583,120
1897	9	4,058,748	15	1,537,071	11	919,401
1898	14	4,535,163	27	4,901,858	31	6,238,641
1899	19	2,322,637	31	7,659,561	47	11,022,930
1900	36	12,147,807	35	7,682,338	36	7,815,742
1901	16	4,566,980	20	3,239,602	22	5,521,265

Year.	Idaho.		Total.	
	Percentage of previous year's crop.	Bushels.	Percentage of previous year's crop.	Bushels.
1883	27	175,500	23	11,604,937
1884	30	204,750	22	11,884,859
1885	25	280,000	34	21,944,480
1886	24	276,960	29	14,238,200
1887	25	259,750	22	12,205,870
1888	30	336,000	29	16,273,070
1889	22	275,440	29	15,404,430
1890	33	478,170	33	21,854,120
1891	28	383,600	32	16,447,500
1892	40	724,400	20	12,730,730
1893	27	457,110	22	13,415,600
1894	29	439,350	32	17,712,540
1895	14	219,380	12	6,367,720
1896	30	366,600	17	10,365,470
1897	22	528,905	11	7,044,125
1898	28	758,148	22	16,433,810
1899	40	1,678,762	35	22,683,890
1900	36	1,238,437	36	28,884,324
1901	37	1,148,713	20	14,476,560

DISPOSAL OF THE WHEAT CROP.

About 30 per cent of the wheat raised in the Pacific coast section—a total of about 20,000,000 bushels—is usually consumed in the same county in which it is grown, the remaining 70 per cent being shipped to various mills throughout the country or exported to foreign countries. California usually consumes 30 per cent of its product in the county in which it is grown; Oregon, 36 per cent; Washington, 24.4 per cent, and Idaho, 46.7 per cent. Home consumption, however, is largely dependent on the price of wheat, as the farmer of this section will generally sell any of his products if he can get a fair price for them.

Table 8 shows the amount of wheat in each of the Pacific coast States consumed in the county in which it was grown, for the years 1882 to 1900.



LOADING WHEAT FOR EXPORT AT PORTLAND, OREGON, AT HIGH WATER, BY MEANS OF ENDLESS BELT.

[Photograph furnished by Mr. Leo Peterson.]

TABLE 8.—*Wheat consumed in county where grown in the Pacific coast States, 1882 to 1900.*

Crop of—	California.		Oregon.		Washington.	
	Percentage of crop.	Bushels.	Percentage of crop.	Bushels.	Percentage of crop.	Bushels.
1882	25	8,982,116	21	2,528,253	64	1,561,600
1883	26	9,443,720	30	3,936,720	65	2,068,755
1884	20	8,864,000	27	4,174,740	27	1,111,860
1885	22	5,850,240	24	3,339,840	25	1,853,000
1886	26	9,402,900	27	3,005,910	62	4,687,200
1887	27	8,215,830	30	4,830,000	65	5,424,250
1888	25	7,112,750	35	5,091,800	58	5,223,480
1889	23	10,069,630	26	3,559,140	32	2,193,920
1890	27	7,862,670	30	3,859,500	45	3,631,950
1891	30	10,978,500	27	3,550,230	25	3,054,000
1892	27	10,572,390	28	2,738,120	26	2,341,300
1893	25	8,713,000	26	2,805,660	15	1,482,600
1894	27	8,201,790	37	3,863,170	31	2,823,480
1895	28	11,227,440	41	4,863,830	30	2,158,800
1896	32	14,431,102	36	3,688,971	30	2,507.458
1897	35	11,337,907	45	8,169,764	33	6,641,134
1898	51	6,234,446	27	6,671,230	21	4,925,139
1899	29	9,785,733	38	8,340,824	22	4,776,287
1900	30	8,563,088	51	8,260,986	20	5,019,332

Crop of—	Idaho.		Total.	
	Percentage of crop.	Bushels.	Percentage of crop.	Bushels.
1882	70	455,000	26	13,526,969
1883	55	375,375	30	15,824,570
1884	65	728,000	23	14,878,600
1885	65	750,100	24	11,793,180
1886	67	696,130	32	17,792,140
1887	70	784,000	34	19,254,080
1888	63	788,760	34	18,216,790
1889	75	1,086,750	26	16,909,440
1890	75	1,027,500	32	16,381,620
1891	75	1,358,250	30	18,940,980
1892	80	1,354,400	29	17,006,210
1893	44	666,600	24	13,667,860
1894	57	893,190	31	15,781,630
1895	47	574,340	31	18,824,410
1896	40	961,645	33	21,589,176
1897	50	1,353,836	37	27,502,641
1898	25	1,049,226	29	18,880,041
1899	44	1,513,645	30	24,416,489
1900	43	1,334,990	32	23,178,396

TRANSPORTATION.

Transportation of the enormous quantity of wheat raised in the Pacific coast region has been reduced to a science, and facilities are such that trains can be run from the wheat fields to tidewater at a very few hours' notice, and a large saving in the handling and warehouse requirements can be made by loading ships directly from the cars. This method of loading is largely practiced in California, where elevators, as commonly known in the East, are unknown, the greater part of the grain being shipped in the identical sack in which it was placed in the wheat field.

In Washington and Oregon, however, the wheat, although it is brought to the shipping point in sacks, is run through an elevator, where it is recleaned and mixed with other grades of wheat to bring it to the required standard grade, after which it is resacked and loaded on the vessels or cars for final shipment.

EXPORTS.

About 27,450,000 bushels of wheat are exported annually from the Pacific coast, with a total value of about $20,000,000. The principal points of shipment are San Francisco, Portland, Oregon, and the Puget Sound ports, Tacoma and Seattle. About half the grain shipped from the entire coast region is cleared at San Francisco. A considerable amount of this is loaded at Port Costa, but all clearances are from the San Francisco port.

During the past ten years about 2,000,000 barrels of flour were annually shipped from the Pacific coast ports, nearly one-half of which was cleared at San Francisco. The total value of these shipments is about $6,800,000. The Puget Sound ports have been rapidly coming to the front in flour shipments, exports from these ports having increased from 172,679 barrels in 1891 to 1,037,583 barrels in 1901, with a total value of $2,965,746.

Reducing the barrels of flour to their equivalent in wheat, we find that it has taken about 36,000,000 bushels of wheat to supply the foreign markets with Pacific coast wheat and flour, total shipments from the coast having averaged that figure during the last ten years. Of this amount California ports furnish more than 20,000,000 bushels, Oregon ports nearly 10,000,000 bushels, and Puget Sound a little more than 6,000,000 bushels.

Tables 9, 10, and 11 show the quantities and value of wheat and wheat flour exported from the several ports of the Pacific coast for the years 1868 to 1900:

TABLE 9.—*Quantity and value of wheat exported from the Pacific coast, 1868 to 1900.*

Year ending June 30—	San Francisco, Cal.		Portland, Oregon.[1]		Astoria, Oregon.[2]	
	Bushels.	Values.	Bushels.	Values.	Bushels.	Values.
1868	5,542,303	$7,538,962	.....	.....	8,619	$9,770
1869	5,530,624	6,236,263	.....	.....	57,982	53,171
1870	7,939,030	8,221,915	.....	.....	25,792	23,175
1871	5,903,427	7,080,510	275,661	$335,623	87,030	89,966
1872	2,268,085	3,164,460	281,326	369,010	74,635	104,544
1873	15,996,162	17,358,543	711,762	709,256	170,828	153,347
1874	11,514,578	14,894,414	1,289,282	1,478,916	391,555	444,435
1875	14,469,958	13,407,691	1,326,979	1,150,917	860,024	754,815
1876	9,693,231	11,653,851	1,785,777	1,951,471	1,104,680	1,245,539
1877	16,840,184	18,035,056	1,820,475	1,965,845	592,593	651,590
1878	6,627,337	8,909,230	2,699,015	3,394,743	972,717	1,240,203
1879	16,723,302	17,231,044	2,069,919	2,074,792	792,778	810,358
1880	17,801,700	20,346,691	2,773,195	3,236,383	649,926	741,912
1881	22,029,331	18,760,362	2,012,085	1,708,755	290,592	256,743
1882	36,169,497	35,562,489	4,734,565	4,618,330	1,525,666	1,504,733
1883	24,319,830	25,531,435	2,230,674	2,209,869	765,322	748,232
1884	18,729,733	19,146,784	2,871,670	2,810,867	906,253	899,226
1885	26,871,453	21,143,253	4,678,296	3,339,153	543,389	393,727
1886	19,044,030	15,817,024	6,037,165	4,517,367	547,045	410,568
1887	19,374,520	17,067,849	4,707,244	3,601,707	573,673	427,998
1888	14,546,335	13,054,884	4,706,730	3,335,406	600,866	414,942
1889	22,658,730	20,063,328	3,472,589	2,910,842	994,188	846,664
1890	22,824,416	18,022,425	2,435,298	1,853,916	460,378	345,221
1891	23,232,719	20,171,125	4,172,768	3,482,195	662,824	540,613
1892	21,324,631	21,583,410	5,072,005	5,048,549	715,542	714,797
1893	17,620,762	13,849,095	5,004,202	3,705,878	216,615	158,700
1894	15,023,191	9,608,785	5,620,704	3,199,254	7,290	3,645
1895	15,993,717	8,601,473	8,989,443	4,231,956	152,613	71,591
1896	17,031,613	10,553,609	5,494,297	3,054,925	161,363	84,638
1897	16,460,629	12,610,605	6,154,970	4,577,670	45,422	33,442
1898	16,178,521	14,617,310	13,224,043	10,842,342	354,770	287,497
1899	3,794,890	2,709,995	9,945,183	6,231,978	46,521	29,871
1900	10,702,902	6,591,895	8,955,544	5,082,662	20,520	12,042

[1] Willamette customs district.

[2] Oregon customs district.

TABLE 9.—*Quantity and value of wheat exported from the Pacific coast, 1868 to 1900*—Continued.

Year ending June 30—	Puget Sound, Wash.		Totals.	
	Bushels.	Values.	Bushels.	Values.
1868	1,528	$1,898	5,552,450	$7,550,630
1869	1,141	1,174	5,589,747	6,290,608
1870	.....	.....	7,964,822	8,245,090
1871	.....	.....	6,266,118	7,506,099
1872	44	61	2,619,090	3,638,075
1873	381	363	16,879,133	18,221,509
1874	1,260	1,058	13,196,675	16.818,823
1875	4,115	3,972	16,661,076	15,317,395
1876	5,323	5,323	12,589,011	14,856,184
1877	4,178	4,317	19,257,430	20,656,808
1878	5,346	5,652	10,304,415	13,549,828
1879	6,959	6,960	19,592,958	20,123,154
1880	1,472	1,472	21,226,293	24,326,458
1881	3,857	3,079	24,335,865	20,728,939
1882	76,833	71,893	42,506,561	41,757,445
1883	308,628	295,625	27,624,454	28,785,161
1884	87,202	89,605	22,594,858	22,946,482
1885	19,049	14,717	32,112,187	24,890,850
1886	272,885	205,009	25,901,125	20,949,968
1887	9,263	6,418	24,664,700	21,103,972
1888	839,392	621,553	20,693,323	17,426,785
1889	2,297,446	1,946,827	29,422,953	25,767,661
1890	1,735,931	1,321,354	27,456,023	21,542,916
1891	3,674,736	2,963,629	31,743,047	27,157,562
1892	4,187,229	4,068,163	31,299,407	31,414,919
1893	3,783,781	2,745,722	26,625,360	20,459,395
1894	4,211,722	2,236,027	24,862,907	15,047,711
1895	4,002,015	1,813,526	29,137,788	14,718,546
1896	2,738,629	1,577,508	25,425,902	15,270,680
1897	2,456,931	1,972,238	25,117,952	19,193,955
1898	8,023,915	6,583,771	37,781,249	32,330,920
1899	5,409,017	3,432,450	19,195,611	12,404,294
1900	3,566,719	2,078,905	23,245,685	13,765,504

TABLE 10.—*Quantity and value of wheat flour exported from the Pacific coast, 1868 to 1900.*

Year ending June 30—	San Francisco, Cal.		Portland, Oregon.[1]		Astoria, Oregon.[2]	
	Barrels.	Values.	Barrels.	Values.	Barrels.	Values.
1868	277,642	$1,763,395	.....	.....	15,283	$87,975
1869	390,519	2,085,669	.....	.....	23,865	118,315
1870	340,736	1,644,944	.....	.....	19,990	95,964
1871	198,223	1,173,638	20,265	$120,999	5,058	27,828
1872	267,083	1,631,443	21,592	131,433	.....	.....
1873	257,765	1,326,254	41,366	179,152	2,415	10,370
1874	598,240	3,781,531	66,259	375,773	35,588	201,243
1875	452,984	2,166,608	109,994	463,052	42,229	180,146
1876	424,928	2,320,566	82,631	396,883	38,875	191,046
1877	501,653	2,772,023	94,862	496,884	40,808	218,809
1878	423,551	2,697,408	47,544	255,915	2,701	14,257
1879	528,105	2,673,884	182,269	862,205	32,739	154,837
1880	467,170	2,495,252	146,828	797,850	27,372	155,703
1881	650,758	2,899,014	309,043	1,299,526	9,624	42,840
1882	849,452	4,178,983	380,048	1,795,307	124,098	591,582
1883	1,068,339	5,481,345	296,036	1,412,526	48,771	226,424
1884	1,234,745	5,957,401	331,894	1,561,093	25,082	125,244
1885	1,298,043	5,359,533	188,210	701,779	2,272	9,088
1886	1,012,219	4,184,412	316,568	1,199,331	22,110	89,358
1887	942,406	3,871,956	410,547	1,494,313	17,347	61,934
1888	821,384	3,343,121	361,035	1,262,533	17,568	68,765
1889	836,645	3,715,298	491,711	1,904,450	62,420	242,254
1890	1,139,863	4,692,283	387,930	1,407,974	38,866	148,522
1891	1,181,872	5,067,661	456,974	1,677,889	37,548	140,187
1892	1,056,057	5,194,073	338,226	1,492,873	8,999	39,228
1893	1,084,561	4,294,178	388,776	1,334,435	.....	.....
1894	784,672	2,642,067	300,585	818,315	.....	.....
1895	878,701	2,631,064	339,048	752,091	.....	.....
1896	954,500	3,121,868	560,233	1,433,401	.....	.....
1897	1,108,502	4,479,384	525,152	1,864,027	8,258	24,708
1898	802,223	3,643,467	638,172	2,475,918	.....	.....
1899	938,153	3,466,648	752,101	2,310,540	4,975	18,562
1900	1,069,966	3,517,681	792,416	2,153,945	4,924	12,756

[1] Willamette customs district.

[2] Oregon customs district.

TABLE 10.—*Quantity and value of wheat flour exported from the Pacific coast, 1868 to 1900*—Continued.

Year ending June 30—	Puget Sound, Wash.		Totals.	
	Barrels.	Values.	Barrels.	Values.
1868	1,721	$10,132	294,646	$1,861,502
1869	1,059	5,322	415,443	2,209,306
1870	415	2,924	361,141	1,743,832
1871	598	4,166	224,144	1,326,631
1872	1,109	8,802	289,784	1,771,678
1873	700	4,266	302,246	1,520,042
1874	4,685	27,190	704,772	4,385,737
1875	9,966	49,808	615,173	2,859,614
1876	10,667	52,923	557,101	2,961,418
1877	14,243	77,735	651,566	3,565,451
1878	12,658	89,545	486,454	3,057,125
1879	9,419	61,147	752,532	3,752,073
1880	5,140	31,360	646,510	3,480,165
1881	6,538	36,016	975,963	4,277,396
1882	19,250	94,312	1,372,848	6,660,184
1883	30,533	155,502	1,443,679	7,275,797
1884	29,948	146,322	1,621,669	7,790,060
1885	43,444	183,117	1,531,969	6,253,517
1886	44,461	162,017	1,395,358	5,635,118
1887	31,863	118,632	1,402,163	5,546,835
1888	66,036	246,145	1,266,023	4,920,564
1889	20,345	82,190	1,411,321	5,944,192
1890	38,167	136,864	1,604,826	6,385,643
1891	172,679	644,459	1,849,073	7,530,196
1892	103,596	439,683	1,506,878	7,165,857
1893	174,119	614,522	1,647,456	6,243,135
1894	277,173	753,242	1,362,430	4,213,624
1895	372,500	869,106	1,590,249	4,252,261
1896	402,489	1,090,935	1,917,222	5,646,204
1897	508,620	1,760,259	2,150,532	8,128,378
1898	615,155	2,294,642	2,055,550	8,414,027
1899	688,535	2,165,193	2,383,764	7,960,943
1900	1,037,583	2,965,746	2,904,889	8,650,128

TABLE 11.—*Quantity of wheat and wheat flour (reduced to its equivalent in wheat) exported from the Pacific coast, 1868 to 1900.*

Year ending June 30—	San Francisco, Cal.	Portland,[1] Oregon.	Astoria,[2] Oregon.	Puget Sound, Wash.	Totals.
	Bushels.	*Bushels.*	*Bushels.*	*Bushels.*	*Bushels.*
1868	6,791,692	.....	77,393	9,272	6,878,357
1869	7,287,960	.....	165,374	5,907	7,459,241
1870	9,472,342	.....	115,747	1,868	9,589,957
1871	6,795,431	366,853	109,791	2,691	7,274,766
1872	3,464,959	378,490	74,635	5,034	3,923,118
1873	17,156,104	897,909	181,696	3,531	18,239,240
1874	14,206,658	1,587,448	551,701	22,342	16,368,149
1875	16,508,386	1,821,952	1,050,054	48,962	19,429,354
1876	11,605,407	2,157,617	1,279,618	53,325	15,095,967
1877	19,097,622	2,247,354	776,229	68,272	22,189,477
1878	8,533,317	2,912,963	984,871	62,307	12,493,458
1879	19,099,774	2,890,129	940,104	49,345	22,979,352
1880	19,903,965	3,433,921	773,100	24,602	24,135,588
1881	24,957,742	3,402,779	333,900	33,278	28,727,699
1882	39,992,031	6,444,781	2,084,107	163,458	48,684,377
1883	29,127,356	3,562,836	984,792	446,026	34,121,010
1884	24,286,085	4,365,193	1,019,122	221,968	29,892,368
1885	32,712,647	5,525,241	553,613	214,547	39,006,048
1886	23,599,016	7,461,721	646,540	472,959	32,180,236
1887	23,615,347	6,554,706	651,735	152,647	30,974,435
1888	18,242,563	6,331,288	679,922	1,136,554	26,390,427
1889	26,423,632	5,685,289	1,275,078	2,388,998	35,772,997
1890	27,953,800	4,180,983	635,275	1,907,683	34,677,741
1891	28,551,143	6,229,151	831,790	4,451,792	40,063,876
1892	26,076,887	6,594,022	756,038	4,653,411	38,080,358
1893	22,501,286	6,753,694	216,615	4,567,317	34,038,912
1894	18,554,215	6,973,336	7,290	5,459,000	30,993,841
1895	19,947,871	10,515,159	152,613	5,678,265	36,293,908
1896	21,326,863	8,015,345	161,363	4,549,829	34,053,400
1897	21,448,888	8,518,154	82,583	4,745,721	34,795,346
1898	19,788,525	16,095,817	354,770	10,792,113	47,031,225
1899	8,016,578	13,329,637	68,909	8,507,425	29,922,549
1900	15,517,749	12,521,416	42,678	8,235,843	36,317,686

[1] Willamette customs district.

[2] Oregon customs district.

PRICES.

Export prices at the different points of shipment on the Pacific coast have varied considerably during the years from 1868 to the present time, and have necessarily been largely governed by the foreign demand for wheat and the quantity available for shipment. In San Francisco in 1868 the average annual export price of wheat was $1.36 per bushel, and in 1872 the highest price for the entire period, $1.398, was reached. Since 1872 numerous and marked fluctuations have been noted, the lowest average price, $0.538, being reached in 1895. This was followed by an increase to $0.904 in 1898 and a decrease to $0.616 in 1900. Export prices at Portland and Puget Sound have fluctuated in a manner somewhat similar to those at San Francisco, the highest average prices being in 1872 and the lowest in 1895. In Portland the prices ranged from $1.312 in 1872 to $0.471 in 1895; and at Seattle and Tacoma, which have been consolidated under the heading of Puget Sound, prices varied from $1.386 in 1872 to $0.453 in 1895.

These prices are in some instances somewhat lower than those for No. 1 wheat quoted on the call board of the San Francisco Produce Exchange, but this is readily accounted for by the fact that a small quantity of inferior wheat has been exported from these points from time to time, and the average annual prices for spot wheat, as quoted by the San Francisco Produce Exchange, are all for the No. 1 grade. These produce exchange prices ranged from $1.416 in the fiscal year 1867–68 to 52.5 cents in 1894–95, and, as is the case with export prices, the variations have been principally caused by supply and demand. Export and call board prices are also in some instances somewhat lower than the farm prices published annually by the Department of Agriculture, but it must be borne in mind that farm prices are all for December 1, and do not represent an average annual price, as is the case with export prices and those of the produce exchange.

In table 12, on the page following, the farm prices are somewhat incomplete owing to the fact that prior to 1882 statistics for Washington and Oregon were included with those for all the other Territories existing at that time, and it has therefore been impossible to make a complete table of prices for those States. For that reason only the most brief analysis of farm prices has been attempted under the heading "Acreage, production, and value," on page 33.

Table 12 shows the average annual export prices of wheat, the price of No. 1 wheat on the San Francisco call board, and the average farm prices of wheat in each of the States of the Pacific coast for the years 1868 to 1900.

TABLE 12.—*Export, call board, and farm prices of wheat in the Pacific coast States, 1868 to 1900.*

Year ending June 30—	Average annual export prices per bushel.			Average annual call board price of No. 1 wheat at San Francisco, per bushel.[1]	Average farm price, December 1, per bushel.				
	San Francisco, Cal.	Portland, Oregon.	Puget Sound, Wash.		California.	Oregon.	Washington.	Idaho.	Average for Pacific coast States.
	Cents.	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*
1868	136	.....	124.2	141.6	103	.....	.....	.....	.....
1869	112.8	.....	102.8	112.2	93	85	.....	.....	.....
1870	103.6	.....	.....	101.4	110	95	.....	.....	.....
1871	119.9	121.8	.....	132.3	141	104	.....	.....	.....
1872	139.8	131.2	138.6	140.4	111	74	.....	.....	.....
1873	108.5	99.6	95.3	105.8	132	90	.....	.....	.....
1874	129.3	114.7	84	123.2	99	68	.....	.....	.....
1875	92.7	86.7	96.5	97.2	118	87	.....	.....	.....
1876	120.2	109.3	100	116.1	114	70	.....	.....	.....
1877	107.1	108	103.3	115.4	130	111	.....	.....	.....
1878	134.4	125.8	105.7	130.8	103	92	.....	.....	.....
1879	103	100.2	100	100.6	123	98	.....	.....	.....
1880	114.3	116.7	100	109.2	96	78	.....	.....	.....
1881	85.2	84.9	79.8	85.7	103	88	.....	.....	.....
1882	98.3	97.5	93.6	96	90	85	83	140	89
1883	105	99.1	95.8	104.1	100	90	85	90	97
1884	102.2	97.9	102.8	98.8	72	48	60	72	66
1885	78.7	71.4	77.3	79.1	67	69	72	75	69
1886	83.1	74.8	75.1	86.1	73	68	67	72	71
1887	88.1	76.5	69.3	91.4	74	68	67	77	71
1888	89.7	70.9	74	84.2	85	78	78	87	82
1889	88.5	83.8	84.7	80.6	70	70	70	77	70
1890	79	76.1	76.1	77.2	76	75	76	78	76
1891	86.8	83.5	80.6	87.8	95	88	75	84	89
1892	101.2	99.5	97.2	98.2	68	64	58	60	64
1893	78.6	74.1	72.6	76.6	53	55	48	60	53
1894	64	56.9	53.1	60.8	57	43	39	46	51
1895	53.8	47.1	45.3	52.5	60	47	41	47	55
1896	62	55.6	57.6	60.8	83	72	74	65	80
1897	76.6	74.4	80.3	76	83	72	68	70	76
1898	90.4	82	82.1	88.3	72	62	54	51	60
1899	71.4	62.7	63.5	68.7	62	53	51	50	56
1900	61.6	56.8	58.3	60.6	58	55	51	46	54

[1] Prices stated per cental by San Francisco call board, and reductions based on bushel of 60 pounds.

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